

**Fishery Management Report No. 06-71**

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# **The North Alaska Peninsula Salmon Report to the Alaska Board of Fisheries, 2007**

by

**Robert L. Murphy**

and

**Philip Tschersich**

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December 2006

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Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative		fork length	FL
deciliter	dL	Code	AAC	mid-eye-to-fork	MEF
gram	g	all commonly accepted		mid-eye-to-tail-fork	METF
hectare	ha	abbreviations	e.g., Mr., Mrs., AM, PM, etc.	standard length	SL
kilogram	kg			total length	TL
kilometer	km	all commonly accepted			
liter	L	professional titles	e.g., Dr., Ph.D., R.N., etc.	<b>Mathematics, statistics</b>	
meter	m			<i>all standard mathematical</i>	
milliliter	mL	at	@	<i>signs, symbols and</i>	
millimeter	mm	compass directions:		<i>abbreviations</i>	
		east	E	alternate hypothesis	H <sub>A</sub>
		north	N	base of natural logarithm	<i>e</i>
		south	S	catch per unit effort	CPUE
		west	W	coefficient of variation	CV
		copyright	©	common test statistics	(F, t, $\chi^2$ , etc.)
		corporate suffixes:		confidence interval	CI
		Company	Co.	correlation coefficient	
		Corporation	Corp.	(multiple)	R
		Incorporated	Inc.	correlation coefficient	
		Limited	Ltd.	(simple)	r
		District of Columbia	D.C.	covariance	cov
		et alii (and others)	et al.	degree (angular)	°
		et cetera (and so forth)	etc.	degrees of freedom	df
		exempli gratia		expected value	<i>E</i>
		(for example)	e.g.	greater than	>
		Federal Information		greater than or equal to	≥
		Code	FIC	harvest per unit effort	HPUE
		id est (that is)	i.e.	less than	<
		latitude or longitude	lat. or long.	less than or equal to	≤
		monetary symbols		logarithm (natural)	ln
		(U.S.)	\$, ¢	logarithm (base 10)	log
		months (tables and		logarithm (specify base)	log <sub>2</sub> , etc.
		figures): first three		minute (angular)	'
		letters	Jan,...,Dec	not significant	NS
		registered trademark	®	null hypothesis	H <sub>0</sub>
		trademark	™	percent	%
		United States		probability	P
		(adjective)	U.S.	probability of a type I error	
		United States of		(rejection of the null	
		America (noun)	USA	hypothesis when true)	$\alpha$
		U.S.C.	United States	probability of a type II error	
			Code	(acceptance of the null	
		U.S. state	use two-letter	hypothesis when false)	$\beta$
			abbreviations	second (angular)	"
			(e.g., AK, WA)	standard deviation	SD
				standard error	SE
				variance	
				population	Var
				sample	var
<b>Weights and measures (English)</b>					
cubic feet per second	ft <sup>3</sup> /s				
foot	ft				
gallon	gal				
inch	in				
mile	mi				
nautical mile	nmi				
ounce	oz				
pound	lb				
quart	qt				
yard	yd				
<b>Time and temperature</b>					
day	d				
degrees Celsius	°C				
degrees Fahrenheit	°F				
degrees kelvin	K				
hour	h				
minute	min				
second	s				
<b>Physics and chemistry</b>					
all atomic symbols					
alternating current	AC				
ampere	A				
calorie	cal				
direct current	DC				
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
(negative log of)					
parts per million	ppm				
parts per thousand	ppt,				
	‰				
volts	V				
watts	W				

***FISHERY MANAGEMENT REPORT NO. 06-71***

**THE NORTH ALASKA PENINSULA SALMON REPORT TO THE  
ALASKA BOARD OF FISHERIES, 2007**

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## ABSTRACT

The North Alaska Peninsula includes the waters of the Bering Sea of the Alaska Peninsula Management Area (Area M) within three miles of the shore from Cape Sarichef on Unimak Island to Cape Menshikof, which borders the Bristol Bay Management Area (Area T). The area is divided into two districts: the Northwestern and Northern districts. Chinook salmon *Oncorhynchus tshawytscha*, sockeye salmon *O. nerka*, coho salmon *O. kisutch*, pink salmon *O. gorbuscha*, and chum salmon *O. keta* are harvested in commercial fisheries in the waters of the North Alaska Peninsula. The majority of the sockeye salmon harvest occurs from June through September in the Nelson Lagoon to Strogonof Point area of the North Alaska Peninsula, which includes the Nelson Lagoon, Bear River, Three Hills, and Ilnik sections. This area is predominately fished by drift and set gillnet gear, with some areas open to purse seine gear. The 2006 commercial salmon harvest on the North Alaska Peninsula was 7,637 Chinook, 2,375,158 sockeye, 93,955 coho, 64,207 pink, and 131,718 chum salmon, and all were above recent harvest averages.

The North Alaska Peninsula sockeye salmon escapement in 2006 was 1,157,546 fish; 215,000 were estimated at Nelson River, 445,000 in Bear River, 48,000 in Sandy River, 88,000 in Ilnik River, 142,610 in river systems draining into Port Heiden, and 101,100 in river systems draining into the Cinder River. Bear River is the largest sockeye salmon producing system in the Alaska Peninsula Management Area. Bear River has two sockeye salmon runs; the early run begins in early June and ends in the latter part of July, while the late run begins in late July and ends in September. Timing of the Nelson, Sandy, Ilnik, Meshik, and Cinder River sockeye salmon runs are similar to the run timing of the Bear River early run.

**Key words:** North Alaska Peninsula, Area M, Chinook salmon, *Oncorhynchus tshawytscha*, sockeye salmon, *Oncorhynchus nerka*, coho salmon, *Oncorhynchus kisutch*, pink salmon, *Oncorhynchus gorbuscha*, chum salmon, *Oncorhynchus keta*, commercial, escapement, fishery, harvest, Bear River, Sandy River, Nelson River, Ilnik River, Meshik River, Cinder River, Alaska Board of Fisheries.

## INTRODUCTION

The North Alaska Peninsula, which is part of the Alaska Peninsula Management Area (Area M), includes the state coastal waters of the Bering Sea from Cape Sarichef on Unimak Island northeast to Cape Menshikof which borders the Bristol Bay Management Area (Area T; Figure 1). This report describes those commercial salmon fisheries that are located on the North Alaska Peninsula which is subdivided into two districts: 1) the Northwestern District, which encompasses the coastal waters from Cape Sarichef to Moffet Point, and 2) the Northern District, which ranges from Moffet Point to Cape Menshikof (Figure 1). Chinook salmon *Oncorhynchus tshawytscha*, sockeye salmon *O. nerka*, coho salmon *O. kisutch*, pink salmon *O. gorbuscha*, and chum salmon *O. keta* are all harvested in commercial fisheries in the waters of the North Alaska Peninsula; however, sockeye salmon are the most economically valuable.

Legal commercial salmon fishing gear in the Northwestern and Northern Districts include purse seine (also hand purse seine) and drift and set gillnet gear (ADF&G 2004). The majority of the salmon harvest occurs in the Northern District, specifically within the area from Nelson Lagoon to Strogonof Point (Figure 2). Within this area, many gear restrictions apply: the Nelson Lagoon Section is open to set gillnet and drift gillnet gear only, the Bear River Section to seine and drift gillnet gear, the Three Hills Section to drift gillnet gear only, and the Ilnik Section to set gillnet and drift gillnet gear.

The commercial salmon fishing season opens in most of the Northwestern District on June 1, and in parts of the Northern District on May 1. Generally, the sections of the Northern District have progressively later opening dates from west to east (Figure 3). Scheduled weekly fishing periods occur in most areas and are usually either 6:00 a.m. Monday to 6:00 p.m. Wednesday (2.5

days/week) or 6:00 a.m. Monday to 6:00 p.m. Thursday (3.5 days/week; Table 1). Modifications to weekly fishing periods occur inseason by emergency order.

Escapement into local salmon systems determines the time and area open to commercial fishing. Sockeye salmon are the primary species harvested on the North Alaska Peninsula. During June 1 through September 15 within the Nelson Lagoon to Stroganof Point area, management emphasis is on four sockeye salmon systems: Nelson, Bear, Sandy, and Ilnik rivers. Of these, Nelson and Bear rivers are the dominant systems with the largest sockeye salmon escapements. Alaska Department of Fish and Game (ADF&G) weir camps located at these four systems provide daily escapement counts that are used to manage commercial fisheries.

## **ESCAPEMENT BY SPECIES**

There are at least 90 salmon streams on the North Alaska Peninsula that are surveyed annually with fixed-wing aircraft. The 2006 North Alaska Peninsula salmon escapements are summarized in Appendix A1 (Chinook, sockeye, pink, and chum salmon numbers are estimated total escapements while coho salmon numbers are peak counts). In 2006, Chinook salmon were observed in 19 streams, sockeye salmon were observed in 54 streams, coho salmon were documented in at least 41 streams, pink salmon in 33 streams, and chum salmon were observed in 59 streams.

### **CHINOOK**

Chinook salmon escapement occurs almost exclusively within streams of the Northern District. The Northwestern District has only three documented Chinook salmon streams while Chinook salmon are found in 18 streams in the Northern District (McCullough 2001). The bulk of the known Chinook salmon escapement occurs in the Nelson, Meshik, and Cinder River systems.

The Nelson River is the only North Alaska Peninsula system with a biological escapement goal (BEG<sup>1</sup>) which is 2,400 to 4,400 fish (Nelson et al. 2006). This goal was met with an escapement of 2,516 Chinook salmon during 2006. The 2006 North Alaska Peninsula Chinook salmon escapement was 32,173 fish (Table 2; Appendix A1). This escapement was higher than the 1987-2006 average (17,272 fish), the 1997-2006 average (19,194 fish), and the 2002-2006 average (24,728 fish; Figure 4).

### **SOCKEYE**

Of the 55 sockeye salmon streams on the North Alaska Peninsula, 26 are in the Northwestern District and 29 in the Northern District (McCullough 2001). The 2006 North Alaska Peninsula sockeye salmon escapement was 1,157,546 fish (Table 2; Appendix A1). All sockeye salmon escapement goals were met or exceeded in 2006. The North Alaska Peninsula 1987-2006 average sockeye salmon escapement was 1,007,210 fish, while the 1997-2006 average escapement was 1,068,800 fish, and the 2002-2006 average escapement was 1,254,819 fish (Figure 5). The majority of the sockeye salmon escapement occurred in the Northern District's four systems that enumerate escapement with weirs (Bear, Nelson, Sandy, and Ilnik rivers). However, in some years, substantial sockeye salmon escapements (>100,000 fish) are observed north of Stroganof Point in the Meshik River (Inner Port Heiden) and Cinder River (including Outer Port Heiden) systems (Table 3). The

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<sup>1</sup> Biological escapement goals are established for salmon stocks where reliable escapement levels and total annual returns (catch plus escapement) can be determined.



Christianson Lagoon system at Uria Bay in the Northwestern District, during some years, also produces substantial sockeye salmon escapement. In 2006, the total Meshik River system sockeye salmon escapement was 142,610 fish, while the Cinder River system escapement was 101,100 fish (Table 3; Appendix A1).

Sockeye salmon are abundant from Nelson Lagoon to Stroganof Point during June through September. Escapement goals, 1997-2006 average escapement estimates, and 2006 escapements for the six major sockeye salmon systems of the North Alaska Peninsula can be found in Table 4. The Nelson River sockeye salmon run begins in mid June, peaks in early July, and ends by mid August. Bear River supports two distinct runs: an early run that begins in early June, peaks in early July, and ends in late July; and the late run which begins in late July, peaks in early-mid August, and ends in mid-to-late September. Sandy River run timing begins in mid June, peaks in early July, and ends in late July. The timing of the sockeye salmon run in the Ilnik, Meshik, and Cinder River systems is early and closely parallels Sandy River run timing.

## **COHO**

Currently there are seventeen coho salmon streams documented in the Northwestern District and 33 documented in the Northern District (McCullough 2001). However, many systems have not been surveyed for coho salmon and the number of systems documented is considered the minimum. Due to inadequate funding and adverse fall weather conditions, too few surveys are flown to accurately estimate total coho salmon escapement abundance. In 2006, 229,440 coho salmon were documented in 41 streams (Appendix A1). On the North Alaska Peninsula, only the Nelson River system has a sustainable escapement goal (SEG<sup>2</sup>) for coho salmon (18,000 fish). The 2006 SEG was met with a minimum of 20,000 coho salmon documented in Nelson River system streams (Appendix A1). The major coho salmon systems are found in Uria Bay, Joshua Green, Nelson, Ilnik, Meshik, and Cinder rivers. Other significant coho salmon runs also occur in rivers located in Swanson Lagoon, and in the Bear, Sandy, and Unangashak rivers, and numerous other systems throughout the North Alaska Peninsula.

## **PINK**

With a few exceptions, pink salmon are usually of only limited economic importance on the North Alaska Peninsula. Currently, there are a total of 39 streams with documented pink salmon runs in the Northern and Northwestern districts (McCullough 2001). The average even-year 1997-2006 pink salmon escapement was 154,052 fish and ranged from 24,900 (2002) to 300,000 (1998; Table 2; Figure 6). Bechevin Bay has historically been the largest pink salmon producing location and the only system that has an SEG (31,000 fish during even-numbered years) which was exceeded in 2006 with an estimated escapement of 116,075 fish (Appendix A1). In the Northern District, Herendeen Bay also produced substantial pink salmon runs during even years since 1990, although in recent years poor market conditions have prevented a directed fishery. In 2006, 252,462 pink salmon were counted in North Alaska Peninsula streams (Table 2; Appendix A1). This escapement was higher than the 1987-2006 even-year average (166,936 fish), the 1997-2006 even-year average (154,052 fish), and the 2002-2006 even-year average (133,121 fish; Figure 6).

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<sup>2</sup> Sustainable escapement goals are established for salmon stocks where reliable escapement levels can be determined but there is not sufficient information to enumerate total annual return (catch plus escapement).

## **CHUM**

Chum salmon streams are the most abundant of all salmon systems in the North Alaska Peninsula, numbering 73 (McCullough 2001). Escapement from 1997-2006 averaged 550,959 chum salmon, with a 2006 escapement of 576,043 fish (Table 2; Appendix A1). The North Alaska Peninsula Northwestern and Northern districts combined) chum salmon BEG range is 219,600 to 454,200 fish (Nelson et al. 2006) and has been met or exceeded in each of the past ten years (Table 2). In 2006, the chum salmon escapement was 193,460 fish in the Northwestern District which was within the SEG range of 100,000 to 215,000 fish, while in the Northern District the escapement was 382,583 chum salmon, exceeding the SEG range of 119,600 to 239,200 fish (Appendix A1; Figures 7 and 8; Nelson et al. 2006). The escapement in the Northwestern District in 2006 was below the previous 5-, 10-, and 20-year averages while the chum salmon escapement in the Northern District was above the 5-, 10-, and 20-year averages (Figures 7 and 8). Due to poor market conditions and limited effort, North Alaska Peninsula chum salmon have been underexploited in recent years.

## **HARVEST BY SPECIES**

### **CHINOOK**

The 2006 Chinook salmon harvest on the North Alaska Peninsula was 7,637 fish, which was above the 1997-2006 average of 6,512 (Table 2). The harvest from 1997-2006 ranged from 3,852 in 2002 to 10,402 fish in 2004 (Table 2). Most of the annual harvest in 2006 occurred incidental to sockeye salmon fishing in the Nelson Lagoon Section. In the past, the Inner Port Heiden Section was a major Chinook salmon harvest location, but in recent years there was no fishery due to weak markets. However in 2005 and 2006, Port Heiden residents secured a Chinook salmon market, and 1,057 fish were harvested in the Inner Port Heiden Section during May and the first few weeks in June during 2006. All of the effort had been by Area T permit holders, and by late June, all of these permit holders went fishing in Bristol Bay and no further harvests occurred.

Area T permit holders are allowed to fish within open waters of Area M of the Cinder River and Inner Port Heiden sections during May and June, and August and September, as well as the Ilnik Lagoon portion of the Ilnik Section during August and September.

### **SOCKEYE**

The 1987-2006 average sockeye harvest in the North Alaska Peninsula was 2,181,414 fish, the 1997-2006 average harvest was 1,895,627, and the 2002-2006 average harvest was 2,163,598 fish (Table 2; Figure 9). The record harvest of 3,866,479 fish occurred in 1993. The bulk of the North Alaska Peninsula harvest occurs in the Nelson Lagoon to Strogonof Point area, with a substantial portion of this harvest occurring in the Port Moller to Strogonof Point area which includes the Bear River, Three Hills, and Ilnik sections (Table 3; Figure 2).

### **Nelson Lagoon Section**

In Nelson Lagoon, the 1987-2006 average sockeye salmon harvest was 317,337, the 1997-2006 average harvest was 296,792 fish, and the 2002-2006 average harvest was 363,352 fish (Figure 10). Annually, between 30-40 permit holders typically fish in this section, and the majority of the gear is set gillnet. The peak weekly sockeye salmon harvest occurs in early-to-mid July, however, in 2006 the run was later than usual and the fishery peaked around mid July (Figure 11). In 2006, the Nelson Lagoon sockeye salmon harvest was 255,265 fish which was the fifth best harvest in the past 10 years and the lowest harvest in the past five years (Figure 10).

### **Bear River Section**

The 1987-2006 average sockeye salmon harvest in the Bear River Section was 780,196 fish, the 1997-2006 average was 575,932 fish, and the 2002-2006 average was 661,363 fish (Table 3; Figure 12). The number of permits fished in the Bear River Section peaked in 1993 when 190 vessels participated (Figure 13). Since then the number of permits gradually decreased to a low of 88 permits in 2002 and in recent years increased to 106 permits. The 2002-2006 average annual number of permits fished of 97 was below the 1997-2006 average of 116 permits and the 1987-2006 average of 139 permits (Figure 13). The peak weekly harvest in the Bear River Section usually occurs in late June and early July, and then decreases with another peak in mid August when the late Bear River sockeye salmon run peaks. In 2006, the Bear River Section peak harvest was later due to a later than usual run timing, and the peak weekly harvest (129,415 sockeye salmon) occurred between July 12 and July 18 (Figure 14). The sockeye salmon harvest in 2006 continued into the third week of September when the local processing facility in the area closed for the season.

### **Three Hills Section**

In the Three Hills Section, the 1987-2006 average sockeye salmon harvest was 326,353 fish, the 1997-2006 average was 204,048 fish, and the 2002-2006 average was 180,190 fish (Table 3; Figure 12). The number of permits fished in the Three Hills Section peaked in 1992 when 140 permits operated in the area and generally decreased until 2004-2005 when 56 permits operated in the section. The average number of permits fishing in the area from 1987-2006 was 112, but decreased to 93 permits fished on average between 1997-2006 and 66 permits fished on average between 2002-2006 (Figure 13). In 2006, 75 permit holders made at least one delivery from the Three Hills Section. Overall there was less fishing effort in the Three Hills Section in 2006 partly due to the closure of the section from June 25 to July 3 due to concern for the Sandy River sockeye salmon escapement. The peak weekly harvest in the Three Hills Section during 2006 occurred during the second week of July when only 44,071 sockeye salmon were harvested (Figure 14).

### **Ilnik Section**

The 1987-2006 Ilnik Section average sockeye salmon harvest was 645,675 fish, while the previous 10-year average (1997-2006) harvest was 701,660 fish, and the previous 5-year average (2002-2006) was 838,297 fish (Table 3; Figure 12). The peak number of permits fished in the Ilnik Section was in 1989 with 159 permits, but effort then decreased until 2002-2003 when 73 permits were fished. In 2006, 113 permits fished in the section which is below the 20-year average (1987-2006 of 122 permits) and 10-year average (1997-2006 of 108 permits), but above the five year average (2002-2006 of 88 permits; Figure 13). Catches within the Ilnik Section typically peaks in late June to early July, then decreases. However in 2006, catches were stronger than usual throughout most of July (Figure 14). The peak weekly harvest was 378,013 sockeye salmon during late June to early July and then decreased until less than 100,000 sockeye salmon for the week were caught in late July (Figure 14).

### **Port Moller to Strogonof Point**

Prior to 1987, the Bear River Section accounted for the majority of the sockeye salmon harvest in the Port Moller to Strogonof Point area which includes the Bear River, Three Hills, and Ilnik sections (Figure 2). Between 1987 and 2006, effort by the North Alaska Peninsula commercial fishing fleet has alternated between the Bear River Section, and the Three Hills and Ilnik sections. From 1987 to 2006, the Bear River Section averaged 44 percent of the total sockeye

harvest within these three sections combined. More recently, between 2002 and 2006, the Bear River Section accounted for an average of 39 percent. Harvest in the Three Hills Section has decreased over time from an average of 19 percent in 1987-2006 to an 11 percent average in 2002-2006, while the harvest in the Ilnik Section has increased from a 37 percent average in 1987-2006 to a 50 percent average in 2002-2006 (Figure 15).

## **COHO**

The majority of the North Alaska Peninsula coho salmon harvest typically occurs in Nelson Lagoon, Bear River, Three Hills, and Ilnik sections of the Northern District (Table 5). In previous years when market conditions existed, the Inner Port Heiden and Cinder River sections had significant harvests and were important harvest areas on the North Alaska Peninsula (Table 5). The 1997-2006 average North Alaska Peninsula harvest was 66,767 coho salmon, and the harvest since 1997 has ranged from 22,162 fish in 2001 to 134,724 fish in 1998. Coho salmon harvests typically begin during the first week of August, peak during the last 10 days of August and first week of September, and end in early September when processing facilities close for the season. In 2006, several major coho salmon stocks were underexploited or not exploited at all due to poor market conditions. This has been the trend during recent years. Only Nelson Lagoon had a directed coho salmon fishery in 2006 where 66,874 fish were harvested. In 2006, 93,955 coho salmon were harvested in the North Alaska Peninsula (Tables 2 and 5).

## **PINK**

The 1998-2006 even-year average pink salmon harvest was 34,136 fish, with a ranging from a low of 15,828 in 2004 to a high of 64,207 in 2006 (Table 2). Directed pink salmon fisheries usually occur when market conditions and salmon surplus to escapement requirements permit a fishery in the Bechevin Bay Section of the Northwestern District and occasionally in the Herendeen Bay Section of the Northern District. The only directed pink salmon fisheries that occurred on the North Alaska Peninsula in 2006 were in Bechevin Bay where approximately 56,000 fish were harvested.

## **CHUM**

The 1997-2006 average chum salmon harvest of 76,425 fish, and ranged from 14,958 in 2004 to 174,523 in 2001 (Table 2). The bulk of the North Peninsula chum salmon harvest usually occurs in the Izembek-Moffet Bay and Bechevin Bay sections of the Northwestern District. Catches from the Herendeen-Moller Bay and Bear River Sections typically dominate the Northern District catch. A directed chum salmon fishery occurred in Bechevin and Izembek-Moffet Bays, as well as Herendeen Bay in 2006, but most of the chum salmon harvest was incidental to the sockeye salmon catch in the Bear River and Ilnik Sections. In 2006, 131,718 chum salmon were harvested on the North Peninsula (Table 2).

## **SOCKEYE SALMON RUN PRODUCTION POTENTIAL**

After August 1, all local and non-local sockeye salmon runs are considered to have ended in the Port Moller to Strogonof Point area, except the late Bear River run. Prior to August 1, no method is available to apportion the catch to North Alaska Peninsula stocks-of-origin. After August 1, the sockeye salmon harvest in the Port Moller to Strogonof Point area is considered to be bound for Bear River. Therefore, the potential sockeye salmon production of the Bear (early), Sandy, and Ilnik River runs were calculated in aggregate, using data from the late Bear River run. The

mean return per spawner (R/S) from the Bear River late run over the last five fully recruited brood years was used as an estimator for the R/S for all these systems (3.65:1; 1994-1998; Appendix B1). The Nelson River sockeye salmon R/S average for the last five fully recruited years was 3.1:1 (Appendix B2). The Bear River late run R/S data was applied to the five-year average escapements for systems (early Bear River run, Sandy and Ilnik rivers) to obtain an indication of annual potential run strength.

The forecasts for the Bear River late run and the Nelson River run were added to the production potential estimates for the Bear (early), Sandy, and Ilnik Rivers to calculate a production potential for 2007 for these four systems.

The potential run size for these four systems in recent years for the entire season would be expected to range from 1,327,000 to 3,922,000 sockeye salmon with a midpoint of 2,625,000 fish (Figure 16). The run potential depicted in Table 6 includes escapement. To determine the annual potential harvest, the targeted escapement goal is subtracted from the run potential, leaving a potential harvest estimate of about 804,000 to 3,399,000 fish with a midpoint of 2,102,000 fish (Figure 16).

These estimates are intended to be used as an indicator of potential sockeye salmon production from four North Alaska Peninsula sockeye runs (Nelson, early and late Bear, Sandy, and Ilnik Rivers) based on R/S data from the Nelson and late Bear River runs and the Nelson and late Bear River forecasts. Production from other Northern District sockeye salmon runs, which have averaged a sockeye salmon escapement of 210,998 fish since 2002, is not included in this analysis. Actual North Alaska Peninsula production is unknown.

## **NELSON RIVER AND BEAR RIVER LATE-RUN SOCKEYE SALMON RUN PROJECTIONS FOR 2007**

### **BEAR RIVER**

The 2007 Bear River late-run sockeye salmon forecast was prepared primarily using median estimates and investigating simple linear regression models of saltwater-age-class relationships with data from the past 17 years. In constructing and evaluating the regression models, standard regression diagnostics were used. Prediction estimates from regression models were only used in cases where the slope of the regression was significantly different from zero ( $P < 0.25$ ). The saltwater-age-3 (3-ocean) sockeye salmon returns were predicted from the previous year 2-ocean returns using simple linear regression ( $P = 0.02$ ). An estimate of variance was calculated from the regression. The remaining sockeye salmon, 1-, 2-, and 4-ocean fish were calculated from the median estimates for each of the age class run estimates. The total run forecast was calculated by summing individual regression and pooled age class estimates. When the median return by age was used, the 80 percent prediction intervals were estimated by calculating the 10th and 90th percentiles of the data. Eighty-percent prediction intervals were calculated for the regression model using the variances estimated from the model. The overall 80 percent prediction interval was calculated as the square root of the sum of the squared 80 percent prediction intervals for each age class forecasted.

### **NELSON RIVER**

The 2007 Nelson River sockeye salmon forecast was prepared primarily by investigating simple linear regression models of saltwater-age-class relationships and temperature data from the past

19 years. The temperature indices were constructed from the King Salmon and Cold Bay airports average annual air temperature for corresponding outmigration years. In constructing and evaluating each of the regression models, standard regression diagnostics were used. Prediction estimates from regression models were only used in cases where the slope of the regression was significantly different from zero ( $P < 0.25$ ). The saltwater-age-2 (2-ocean) sockeye salmon returns were predicted from the King Salmon temperature index using simple linear regression ( $P = 0.05$ ). The 3-ocean sockeye returns were predicted by linear regression of the ratio between 3- and 2-ocean fish (same outmigration year) on the Cold Bay temperature index ( $P = 0.01$ ). Estimates of variance were calculated from each regression. The remaining sockeye salmon, 1- and 4-ocean fish were calculated from the median estimates for each of the age class run estimates. The total run forecast was calculated by summing individual regression and pooled age class estimates. When the median return by age was used, the 80 percent prediction intervals were estimated by calculating the 10th and 90th percentiles of the data. Eighty-percent prediction intervals for the regression estimates were calculated using the variances of the regression models. The overall 80 percent prediction intervals were calculated as the square root of the sum of the squared 80 percent prediction intervals for each age class forecasted.

The following table lists the 2007 run projections and 80 percent prediction intervals (P.I.) for Nelson River and Bear River late-run sockeye salmon:

System	Estimate	80% P.I.	
		Low	High
Nelson	502,000	260,000	744,000
Bear (Late Run)	599,000	328,000	869,000

Regression models for Bear River failed to significantly predict 2-ocean returns ( $P > 0.25$ ); therefore, a median estimate was used. The 3-ocean run component historically comprises 26 percent of the Bear Lake late run. Because of the uncertainty associated with the variable predictive capabilities of the sibling data and that a majority of the run has been estimated based on a median, our confidence in this forecast is fair.

Historically, 2-ocean sockeye salmon comprised about 62 percent of the Nelson River run and the regression model for 2-ocean fish was significant ( $P = 0.05$ ). The regression relationship for the 3-ocean run component, which historically comprised 34 percent of the Nelson River run, also had a highly significant slope ( $P = 0.01$ ). Because of these qualities, our confidence in this forecast is good.

## AREA M AND AREA T OVERLAP AREA

The Area M (Alaska Peninsula) and Area T (Bristol Bay) overlap area consists of the Cinder River Section, Inner Port Heiden Section, and Ilnik Lagoon (Figure 17). The overlap area was created shortly after statehood to allow Bristol Bay fishermen, primarily those residents of Port Heiden and Pilot Point, the opportunity to fish close to home before and after the Bristol Bay salmon fishery. Permit holders registered for the Bristol Bay area historically fished for Chinook and coho salmon in the Inner Port Heiden Section and occasionally in Ilnik Lagoon for coho salmon. Pilot Point area permit holders registered for the Bristol Bay area were given the opportunity to fish in the Cinder River Section for Chinook and coho salmon which they

historically have done, and still participate in Bristol Bay sockeye salmon fisheries. The overlap area allows all Area T permit holders the opportunity to fish within portions of the Alaska Peninsula Management Area.

Lack of markets in recent years has eliminated most of the effort in the Cinder River and Inner Port Heiden Sections. Nearly all of the recent effort, in years when significant effort occurred in the Inner Port Heiden and Cinder River sections, has been from Area T permit holders targeting coho salmon in August and September. During 2005 and 2006, local Area T permit holders fished in the Inner Port Heiden Section for Chinook and sockeye salmon during June prior to departing to fish within Area T. During every month except July, Area T permit holders are allowed to fish during the open season in the Inner Port Heiden and Cinder River Sections (Figure 17). Area T permit holders are also allowed to fish inside Ilnik Lagoon during August and September. Prior to 1990, Area T permit holders were allowed to fish in the entire Ilnik Section during August and September.

Since 1976, when 16 Area T permit holders began fishing the overlap area, the number of Area T permit holders increased and peaked in 1992 with 122 permits (104 drift gillnet and 18 set gillnet). In 2006, there were six Area T permit holders that participated within the overlap area. All of the 2006 effort in the overlap area occurred in the Inner Port Heiden Section during June targeting mainly Chinook salmon. Effort from Area T permit holders has also occurred in the Cinder River and Inner Port Heiden Sections during June for Chinook and occasionally sockeye salmon when markets are available (Figure 17).

In 1986, Area T fishermen started operating in the Ilnik and Outer Port Heiden Sections. In 1990, the Alaska Board of Fisheries (BOF) eliminated Area T fishermen from the Ilnik Section (except inside Ilnik Lagoon) and closed the Outer Port Heiden Section to all commercial salmon fishing operations by both Area M and Area T fishermen due to concern over potential interception of coho salmon during August and September bound for Inner Port Heiden (Meshik River).

## **BOARD OF FISHERIES REGULATION CHANGES**

BOF regulation changes instituted in the Northern District are summarized in Table 7.

## **MANAGEMENT STRATEGY**

The Bear River, Three Hills, and Ilnik Sections are managed using catch per unit effort indicators and the escapement strength of Bear, Sandy, Ilnik, and Meshik rivers as determined by aerial surveys and weir counts (Murphy and Tschersich 2006). Table 8 briefly depicts the sockeye salmon stocks used to manage these three sections. This description is not a detailed management strategy, but a general account of the factors that are considered when management actions are taken.

### **BEAR RIVER AND THREE HILLS SECTIONS**

The Bear River and Three Hills Sections are managed on the basis of Bear and Sandy River sockeye salmon stocks (Table 8). When the escapement objectives in Bear and Sandy Rivers are not achieved, the Bear River and Three Hills Sections may be closed until escapements increase sufficiently to warrant a fishery. If escapements are not far behind interim objectives and harvests indicate sufficient run strength, then the closed waters at the river terminus may be expanded to achieve the escapement objectives while allowing effort on incoming fish outside

the protected area. This prevents a build-up of fish near the river mouths and a resulting excess number of fish moving up river. If escapement into Ilnik and/or Ocean River (if Ocean River flows into the Bering Sea versus Ilnik Lagoon, which occasionally occurs) is low and area closures in the Ilnik Section are not effective, the eastern portion of the Three Hills Section line may be moved to the west to provide for a larger closed water area in an attempt to increase the escapement.

## **ILNIK SECTION**

Prior to July 20, the Ilnik Section southwest of Unangashak Bluffs (Figure 2) and inside of Ilnik Lagoon, will be managed primarily for Ilnik sockeye salmon stocks unless a management concern exists for Ugashik River stocks (Table 8). That portion of the Ilnik Section southwest of Unangashak Bluffs (excluding Ilnik Lagoon which opens May 1) will open to commercial salmon fishing on June 25 if the escapement into Ilnik River warrants. That portion of the Ilnik Section northeast of Unangashak Bluffs to Strogonof Point is managed prior to July 20 on the basis of Meshik and Ilnik river sockeye salmon stocks.

Prior to July 21, management action will also be taken in the Ilnik Section to protect Ugashik River sockeye salmon stocks when district lines are reduced to limit harvest in the Egegik District. If Ilnik, Meshik, and Ugashik river sockeye salmon runs are expected to meet escapement objectives prior to July 21, fishing time in the Ilnik Section will be based on the abundance of Ilnik and Meshik river sockeye salmon stocks. From July 20 to August 15, the Ilnik Section will be managed for Bear River sockeye salmon stock escapement. After August 15, the Ilnik Section is managed based on coho salmon return to Ilnik Lagoon.

## **OUTLOOK FOR 2007**

The total projected 2007 commercial salmon harvest for the North Alaska Peninsula includes: 7,000 Chinook, 2,100,000 sockeye, 80,000 coho, 10,000 pink and 50,000 chum salmon. The 2007 Nelson Lagoon forecasted sockeye salmon harvest is predicted to be 352,000, and the Bear River late-run (August and September) forecasted harvest is 482,000 fish (Eggers *in press*). The bulk of the remaining harvest of 1,266,000 fish is expected to occur in the Bear River, Three Hills, and Ilnik sections during June and July.

## **LITERATURE CITED**

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## **TABLES AND FIGURES**

**Table 1.-Scheduled North Alaska Peninsula fishing periods as described in the 2004-2007 regulation book.**

<b>Section</b>	<b>Open Season</b>	<b>Scheduled Fishing Period</b>
Cinder River, Outside Shagong Lagoon	August 1 - September 30	6:00 a.m. Monday to 6:00 p.m. Wednesday
Cinder River, inside Shagong Lagoon	May 1 - September 30	6:00 a.m. Monday to 6:00 p.m. Wednesday
Outer Port Heiden	No open season	
Inner Port Heiden	May 1 - September 30	6:00 a.m. Monday to 6:00 p.m. Wednesday
Ilnik Section southwest of Unangashak Bluffs (159° 10.25' W long.) excluding Ilnik Lagoon and within the Seal Islands	June 25 - September 30	6:00 a.m. Monday to 6:00 p.m. Wednesday
Ilnik Section between Unangashak Bluffs (159°10.25' W long.) to Stroganof Point (158° 50.45' W long.).	June 25 - September 30	6:00 a.m. Monday to 6:00 p.m. Wednesday
Ilnik Lagoon Section (Ilnik Lagoon and within the Seal Islands)	May 1 – June 24	12:00 noon Monday to 11:59 p.m. Wednesday
Ilnik Lagoon Section (Ilnik Lagoon and within the Seal Islands)	June 25 - September 30	6:00 a.m. Monday to 6:00 p.m. Wednesday
Three Hills	June 25 - June 30	6:00 a.m. Monday to 6:00 p.m. Wednesday
Three Hills	July 1 - September 30	6:00 a.m. Monday to 6:00 p.m. Thursday
Bear River	May 1 - June 30	6:00 a.m. Monday to 6:00 p.m. Wednesday
Bear River	July 1 - September 30	6:00 a.m. Monday to 6:00 p.m. Thursday

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**Table 1.-Page 2 of 2.**

<b>Section</b>	<b>Open Season</b>	<b>Fishing Period</b>
Port Moller Bight	May 1 - September 30	6:00 a.m. Monday to 6:00 p.m. Thursday
Herendeen-Moller Bay	May 1 - July 20	6:00 a.m. Monday to 6:00 p.m. Thursday
Nelson Lagoon	May 1 - June 15	6:00 a.m. Monday to 12:00 midnight Wednesday
Nelson Lagoon	June 16 - August 15	6:00 a.m. Monday to 12:00 midnight Thursday
Nelson Lagoon	August 16 - September 30	6:00 a.m. Monday to 12:00 midnight Wednesday
Caribou Flats	No open season	
Black Hills	May 1 - June 30	6:00 a.m. Monday to 6:00 p.m. Wednesday
Black Hills	July 1 - September 30	6:00 a.m. Monday to 6:00 p.m. Thursday
Izembek-Moffet Bay	June 1 - August 10	6:00 a.m. Monday to 6:00 p.m. Thursday
Swanson Lagoon	June 1 - August 10	6:00 a.m. Monday to 6:00 p.m. Thursday
Urilia Bay <sup>a</sup>	By Emergency Order Only	6:00 a.m. Monday to 6:00 p.m. Thursday
Dublin Bay	July 10 - August 10	6:00 a.m. Monday to 6:00 p.m. Thursday
Bechevin Bay	June 1 - September 30	By Emergency Order Only

<sup>a</sup> In recent years, the fishing season in the Urilia Bay Section has been delayed until late June to obtain a substantial amount of sockeye salmon escapement before fishing begins.

**Table 2.-North Alaska Peninsula salmon runs by species, 1962-2006.**

Year		Number of Salmon					Total
		Chinook	Sockeye	Coho	Pink	Chum	
1962	Catch	5,400	249,700	35,200	31,200	34,900	356,400
	Escapement <sup>a</sup>	4,400	351,200		4,000	150,900	
	Total	9,800	600,900		35,200	185,800	
1963	Catch	3,600	225,200	40,500	6,900	49,900	326,100
	Escapement <sup>a</sup>	6,200	351,000		4,400 <sup>b</sup>	203,200	
	Total	9,800	576,200		11,300 <sup>b</sup>	253,100	
1964	Catch	3,600	250,800	36,600	6,800	139,000	436,800
	Escapement <sup>a</sup>	25,900	419,900		15,100	156,100	
	Total	29,500	670,700		21,900	295,100	
1965	Catch	6,100	199,500	34,500	2,100	69,700	311,900
	Escapement <sup>a</sup>	22,100	238,400		900	49,300	
	Total	28,200	437,900		3,000	119,000	
1966	Catch	5,600	245,300	37,300	16,000	82,800	387,000
	Escapement <sup>a</sup>	8,200	283,300		2,000	149,000	
	Total	13,800	528,600		18,000	231,800	
1967	Catch	5,500	224,700	46,800	700	41,300	319,000
	Escapement <sup>a</sup>	12,200	299,700		700	122,600	
	Total	17,700	524,400		1,400	163,900	
1968	Catch	4,500	237,100	64,900	200	73,500	380,200
	Escapement <sup>a</sup>	15,800	251,300		26,500	250,800	
	Total	20,300	488,400		26,700	324,300	
1969	Catch	4,800	321,300	49,100	100	28,100	403,400
	Escapement <sup>a</sup>	19,500	575,000		4,400	146,800	
	Total	24,300	896,300		4,500	174,900	
1970	Catch	3,829	187,793	26,327	7,904	47,989	273,842
	Escapement <sup>a</sup>	8,300	451,500		11,100	169,800	
	Total	12,129	639,293		19,004	217,789	
1971	Catch	2,187	353,784	8,222	297	64,154	428,644
	Escapement <sup>a</sup>	5,200	435,100		8,600	109,400	
	Total	7,387	788,884		8,897	173,554	
1972	Catch	1,790	179,325	9,684	129	84,687	275,615
	Escapement <sup>a</sup>	5,000	190,200		1,300	124,000	
	Total	6,790	369,525		1,429	208,687	
1973	Catch	2,569	165,388	19,776	143	152,773	340,649
	Escapement <sup>a</sup>	4,300	180,200		200	122,400	
	Total	6,869	345,588		343	275,173	
1974	Catch	2,710	246,209	16,799	10,599	34,417	310,734
	Escapement <sup>a</sup>	3,000	332,800		23,000	105,100	
	Total	5,710	579,009		33,599	139,517	

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**Table 2.-**Page 2 of 4.

		Number of Salmon					
Year		Chinook	Sockeye	Coho	Pink	Chum	Total
1975	Catch	2,093	233,293	28,349	295	8,770	272,800
	Escapement <sup>a</sup>	4,600	516,800		600	109,200	
	Total	6,693	750,093		895	117,970	
1976	Catch	4,947	641,134	26,061	672	73,589	746,403
	Escapement <sup>a</sup>	6,000	532,600		37,300	293,400	
	Total	10,947	1,173,734		37,972	366,989	
1977	Catch	5,489	472,006	34,137	888	129,168	641,688
	Escapement <sup>a</sup>	7,100	541,100		8,500	681,200	
	Total	12,589	1,013,106		9,388	810,368	
1978	Catch	13,524	896,616	63,341	485,224	163,804	1,622,509
	Escapement <sup>a</sup>	13,700	1,213,500		96,800	310,500	
	Total	27,224	2,110,116		582,024	474,304	
1979	Catch	15,704	1,979,167	112,835	4,994	65,711	2,178,411
	Escapement <sup>a</sup>	15,800	1,574,000		9,300	305,300	
	Total	31,504	3,553,167		14,294	371,011	
1980	Catch	16,627	1,397,118	127,878	301,672	700,196	2,543,491
	Escapement <sup>a</sup>	11,000	1,387,600		103,600	769,500	
	Total	27,627	2,784,718		405,272	1,469,696	
1981	Catch	18,385	1,844,335	155,420	11,217	706,818	2,736,175
	Escapement <sup>a</sup>	12,400	1,347,900		6,100	535,200	
	Total	30,785	3,192,235		17,317	1,242,018	
1982	Catch	29,770	1,435,277	238,016	12,321	331,133	2,046,517
	Escapement <sup>a</sup>	20,000	718,400		51,700	457,600	
	Total	49,770	2,153,677		64,021	788,733	
1983	Catch	29,006	2,090,142	75,138	3,404	348,307	2,545,997
	Escapement <sup>a</sup>	25,700	580,300		4,000	392,600	
	Total	54,706	2,670,442		7,404	740,907	
1984	Catch	22,770	1,798,780	200,482	46,369	805,132	2,873,533
	Escapement <sup>a</sup>	17,700	826,000		56,600	870,200	
	Total	40,470	2,624,780		102,969	1,675,332	
1985	Catch	23,403	2,596,073	176,118	3,054	666,616	3,465,264
	Escapement <sup>a</sup>	12,900	898,100		1,400	344,200	
	Total	36,303	3,494,173		4,454	1,010,816	
1986	Catch	11,735	2,463,734	164,071	22,630	271,216	2,933,386
	Escapement <sup>a</sup>	8,700	580,300		13,300	243,600	
	Total	20,435	3,044,034		35,930	514,816	
1987	Catch	14,186	1,209,435	171,784	3,486	368,696	1,767,587
	Escapement <sup>a</sup>	10,700	556,000		100	510,900	
	Total	24,886	1,765,435		3,586	879,596	

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**Table 2.-**Page 3 of 4.

		Number of Salmon					
Year		Chinook	Sockeye	Coho	Pink	Chum	Total
1988	Catch	16,721	1,528,107	233,966	65,242	393,075	2,237,111
	Escapement <sup>a</sup>	11,700	614,900	200-300 <sup>b,c</sup>	43,500	500,300	
	Total	28,421	2,143,007		108,742	893,375	
1989	Catch	10,698	1,718,001	227,551	4,103	156,992	2,117,345
	Escapement <sup>a</sup>	5,600	814,400	150-250 <sup>b,c</sup>	1,900	212,300	
	Total	16,298	2,532,401		6,003	369,292	
1990	Catch	12,320	2,416,047	192,978	517,724	126,113	3,265,182
	Escapement <sup>a</sup>	7,100	1,032,200	140-175 <sup>b,c</sup>	132,200	226,400	
	Total	19,420	3,448,247		649,924	352,513	
1991	Catch	9,359	2,391,406	218,274	4,249	191,278	2,814,566
	Escapement <sup>a</sup>	9,600	1,317,300		6,300	303,300	
	Total	18,959	3,708,706		10,549	494,578	
1992	Catch	13,136	3,575,507	206,813	194,395	341,616	4,331,467
	Escapement <sup>a</sup>	6,600	861,300		207,600	351,700	
	Total	19,736	4,436,807		401,995	693,316	
1993	Catch	22,417	3,866,479	64,376	5,328	134,957	4,093,557
	Escapement <sup>a</sup>	13,700	1,003,800		72,800	402,400	
	Total	36,117	4,870,279		78,128	537,357	
1994	Catch	18,508	2,783,156	241,913	226,315	83,897	3,353,789
	Escapement <sup>a</sup>	38,400	1,211,400		133,200	480,200	
	Total	56,908	3,994,556		359,515	564,097	
1995	Catch	7,540	3,272,748	135,639	12,171	99,293	3,527,391
	Escapement <sup>a</sup>	24,400	1,077,000		8,200	756,300	
	Total	31,940	4,349,748		20,371	855,593	
1996	Catch	4,941	1,911,126	157,313	53,842	67,956	2,195,178
	Escapement <sup>a</sup>	25,700	967,900		382,600	823,100	
	Total	30,641	2,879,026		436,442	891,056	
1997	Catch	10,352	2,151,010	94,776	50,701	97,380	2,404,219
	Escapement <sup>a</sup>	19,500	820,000		25,000	388,200	
	Total	29,852	2,971,010		75,701	485,580	
1998	Catch	5,928	1,087,552	134,724	34,810	69,516	1,332,530
	Escapement <sup>a</sup>	15,000	894,000		300,000	729,500	
	Total	20,928	1,981,552		334,810	799,016	
1999	Catch	4,886	1,783,804	53,907	4,367	50,120	1,897,084
	Escapement <sup>a</sup>	10,900	897,300		25,000	666,300	
	Total	15,786	2,681,104		29,367	716,420	

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**Table 2.-Page 4 of 4.**

		Number of Salmon					
Year		Chinook	Sockeye	Coho	Pink	Chum	Total
2000	Catch	3,904	1,968,882	83,655	34,373	93,696	2,184,510
	Escapement <sup>a</sup>	9,600	927,200		70,900	594,700	
	Total	13,504	2,896,082		105,273	688,396	
2001	Catch	4,412	1,147,030	22,162	12,469	174,523	1,360,596
	Escapement <sup>a</sup>	13,300	875,400		24,300	692,700	
	Total	17,712	2,022,430		36,769	867,223	
2002	Catch	3,852	1,415,872	28,751	21,461	51,040	1,520,976
	Escapement <sup>a</sup>	18,900	894,500		24,900	679,900	
	Total	22,752	2,310,372		46,361	730,940	
2003	Catch	4,545	1,477,391	53,137	18,624	38,755	1,592,452
	Escapement <sup>a</sup>	11,078	1,231,411		20,000	450,660	
	Total	15,623	2,708,802		38,624	489,415	
2004	Catch	10,402	2,433,778	33,920	15,828	14,958	2,508,886
	Escapement <sup>a</sup>	30,874	1,433,827		122,000	434,950	
	Total	41,276	3,867,605		137,828	449,908	
2005	Catch	9,198	3,115,792	68,680	3,830	42,539	3,240,039
	Escapement <sup>a</sup>	30,617	1,556,811		52,628	296,640	
	Total	39,815	4,672,603		56,458	339,179	
2006	Catch	7,637	2,375,158	93,955	64,207	131,718	2,672,675
	Escapement <sup>a</sup>	32,173	1,157,546		252,462	576,043	
	Total	39,810	3,532,704		316,669	707,761	
1997-2006 Average							
	Catch	6,512	1,895,627	66,767	34,136 <sup>d</sup>	76,425	2,071,397
	Escapement <sup>a</sup>	19,194	1,068,800		154,052 <sup>d</sup>	550,959	
	Total	25,706	2,964,426		188,188 <sup>d</sup>	627,384	

Note: catch numbers do not include test fish harvest or fish retained for personal use.

<sup>a</sup> Escapements are indexed totals.

<sup>b</sup> These figures are very rough extrapolated estimates.

<sup>c</sup> Number of fish in thousands.

<sup>d</sup> Averages for pink salmon include only the even-numbered years 1998, 2000, 2002, 2004, and 2006.

**Table 3.-**Northern District sockeye salmon runs by section (number of fish), 1962-2006.

Year	Outer Port Heiden <sup>a</sup> and Cinder River	Inner Port Heiden	Ilnik	Three Hills	Bear River <sup>b</sup>	Combined Ilnik, Three Hills, & Bear R. Sections	Port Moller Bight & Herendeen- Moller Bay	Nelson Lagoon	Caribou Flats & Black Hills	Northern District Totals
1962 <sup>c</sup> Catch	900	17,800	9,700	<sup>e</sup>	142,900	152,600	0	69,600	0	240,900
Escapement	5,000	19,000 <sup>d</sup>	5,900	<sup>e</sup>	215,000	220,900	100	54,200	1,000	300,200
Total	5,900	36,800 <sup>d</sup>	15,600	<sup>e</sup>	357,900	373,500	100	123,800	1,000	541,100
1963 <sup>c</sup> Catch	0	0	26,600	<sup>e</sup>	120,000	146,600	0	71,500	0	218,100
Escapement	1,400	14,200 <sup>d</sup>	10,400	<sup>e</sup>	238,600	249,000	100	31,000	1,300 <sup>d</sup>	297,000
Total	1,400	14,200 <sup>d</sup>	37,000	<sup>e</sup>	358,600	395,600	100	102,500	1,300 <sup>d</sup>	515,100
1964 <sup>c</sup> Catch	0	6,300	33,300	<sup>e</sup>	107,500	140,800	0	88,700	0	235,800
Escapement	1,500	10,000	6,500	<sup>e</sup>	250,200	256,700	200	80,000	1,500	349,900
Total	1,500	16,300	39,800	<sup>e</sup>	357,700	397,500	200	168,700	1,500	585,700
1965 <sup>c</sup> Catch	0	9,700	58,400	<sup>e</sup>	62,400	120,800	100	53,800	0	184,400
Escapement	7,500	30,000	12,500	<sup>e</sup>	137,000	149,500	0	37,000	500	224,500
Total	7,500	39,700	70,900	<sup>e</sup>	199,400	270,300	100	90,800	500	408,900
1966 <sup>c</sup> Catch	0	8,000	11,000	<sup>e</sup>	152,600	163,600	0	60,000	0	231,600
Escapement	3,000	11,700 <sup>d</sup>	24,300	<sup>e</sup>	185,000	209,300	600	36,500	2,300	263,400
Total	3,000	19,700 <sup>d</sup>	35,300	<sup>e</sup>	337,600	372,900	600	96,500	2,300	495,000
1967 <sup>c</sup> Catch	0	3,100	0	<sup>e</sup>	156,100	156,100	12,500	40,200	0	211,900
Escapement	3,800 <sup>c</sup>	12,000 <sup>d</sup>	26,400	<sup>e</sup>	200,000	226,400	200	42,000	500 <sup>d</sup>	284,900
Total	3,800 <sup>c</sup>	15,100 <sup>d</sup>	26,400	<sup>e</sup>	356,100	382,500	12,700	82,200	500 <sup>d</sup>	496,800
1968 <sup>c</sup> Catch	0	0	78,600	<sup>e</sup>	90,500	169,100	3,400	51,100	0	223,600
Escapement	4,100	15,000 <sup>d</sup>	15,000	<sup>e</sup>	166,000	181,000	400	31,000	2,000 <sup>d</sup>	233,500
Total	4,100	15,000 <sup>d</sup>	93,600	<sup>e</sup>	256,500	350,100	3,800	82,100	2,000 <sup>d</sup>	457,100
1969 <sup>c</sup> Catch	0	5,200	24,000	<sup>e</sup>	205,500	229,500	4,400	72,800	0	311,900
Escapement	3,800 <sup>d</sup>	15,000 <sup>d</sup>	15,600	<sup>e</sup>	406,000	421,600	100	78,500	2,500 <sup>d</sup>	521,500
Total	3,800 <sup>d</sup>	20,200 <sup>d</sup>	39,600	<sup>e</sup>	611,500	651,100	4,500	151,300	2,500 <sup>d</sup>	833,400

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**Table 3.-Page 2 of 7.**

Year	Outer Port Heiden <sup>a</sup> and Cinder River	Inner Port Heiden	Ilnik	Three Hills	Bear River <sup>b</sup>	Combined Ilnik, Three Hills, & Bear R. Sections	Port Moller Bight & Herendeen- Moller Bay	Nelson Lagoon	Caribou Flats & Black Hills	Northern District Totals
1970 <sup>c</sup> Catch	0	0	21,011	<sup>e</sup>	109,209	130,220	1,672	52,043	21	183,956
Escapement	1,500	14,100	15,300	800	294,000	310,100	0	82,400	1,400	409,500
Total	1,500	14,100	36,311	800	403,209	440,320	1,672	134,443	1,421	593,456
1971 <sup>c</sup> Catch	0	0	16,153	40,929	238,628	295,710	1,301	47,536	0	344,547
Escapement	2,000	30,800	26,100	400	281,000	307,500	200	60,100	500	401,100
Total	2,000	30,800	42,253	41,329	519,628	603,210	1,501	107,636	500	745,647
1972 <sup>c</sup> Catch	0	2	4,478	7,513	136,160	148,151	1,006	23,227	0	172,386
Escapement	400	3,500	13,100	0	135,400	148,500	0	28,000	0	180,400
Total	400	3,502	17,578	7,513	271,560	296,651	1,006	51,227	0	352,786
1973 <sup>c</sup> Catch	0	0	0	16,659	117,678	134,337	3,287	23,896	0	161,520
Escapement	1,200	7,200	16,000	0	130,100	146,100	0	18,700	0	173,200
Total	1,200	7,200	16,000	16,659	247,778	280,437	3,287	42,596	0	334,720
1974 <sup>c</sup> Catch	0	0	0	46,895	157,457	204,352	7,730	25,611	34	237,727
Escapement	1,300	1,400	14,500	100	266,500	281,100	0	39,900	1,800	325,500
Total	1,300	1,400	14,500	46,995	423,957	485,452	7,730	65,511	1,834	563,227
1975 <sup>c</sup> Catch	0	644	411	8,296	165,730	174,437	3,739	51,519	0	230,339
Escapement	900	5,100	40,500	300	310,000	350,800	100	138,600	2,000	497,500
Total	900	5,744	40,911	8,596	475,730	525,237	3,839	190,119	2,000	727,839
1976 <sup>c</sup> Catch	3	4,973	11,954	207,765	310,869	530,588	9,912	74,914	0	620,390
Escapement	6,300	30,300	15,100	600	328,000	343,700	500	108,900	7,400	497,100
Total	6,303	35,273	27,054	208,365	638,869	874,288	10,412	183,814	7,400	1,117,490
1977 <sup>c</sup> Catch	8	3,416	12,592	85,295	268,676	366,563	11,061	56,314	44	437,406
Escapement	3,900	23,600	20,600	100	265,200	285,900	13,500	155,000	4,100	486,000
Total	3,908	27,016	33,192	85,395	533,876	652,463	24,561	211,314	4,144	923,406

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**Table 3.-**Page 3 of 7.

Year	Outer Port Heiden <sup>a</sup> and Cinder River	Inner Port Heiden	Ilnik	Three Hills	Bear River <sup>b</sup>	Combined Ilnik, Three Hills, & Bear R. Sections	Port Moller Bight & Herendeen- Moller Bay	Nelson Lagoon	Caribou Flats & Black Hills	Northern District Totals
1978 <sup>c</sup> Catch	0	829	7,457	24,711	556,393	588,561	53,731	213,430	0	856,551
Escapement	3,800	18,800	21,200	0	814,000	835,200	4,900	304,300	1,500	1,168,500
Total	3,800	19,629	28,657	24,711	1,370,393	1,423,761	58,631	517,730	1,500	2,025,051
1979 <sup>c</sup> Catch	140	36,940	53,972	140,390	1,320,851	1,515,213	32,121	320,856	0	1,905,270
Escapement	6,000	46,700 <sup>d</sup>	97,200	300	1,013,000	1,110,500	5,000	360,100	3,000	1,531,300
Total	6,140	83,640 <sup>d</sup>	151,172	140,690	2,333,851	2,625,713	37,121	680,956	3,000	3,436,570
1980 <sup>c</sup> Catch	46	24,628	121,574	130,653	741,861	994,088	10,460	318,526	0	1,347,748
Escapement	30,000	47,000 <sup>d</sup>	100,000	0	751,000	851,000	1,500	352,600	3,900	1,286,000
Total	30,046	71,628 <sup>d</sup>	221,574	130,653	1,492,861	1,845,088	11,960	671,126	3,900	2,633,748
1981 <sup>c</sup> Catch	24	3,847	24,334	44,559	1,327,219	1,396,112	18,610	374,722	0	1,793,315
Escapement	100,000	26,600 <sup>d</sup>	151,000	0	741,500	892,500	600	251,000	4,000 <sup>d</sup>	1,274,700
Total	100,024	30,447 <sup>d</sup>	175,334	44,559	2,068,719	2,288,612	19,210	625,722	4,000 <sup>d</sup>	3,068,015
1982 <sup>c</sup> Catch	0	8,782	35,088	107,418	1,009,291	1,151,797	11,336	229,203	419	1,401,537
Escapement	13,000 <sup>d</sup>	62,000 <sup>d</sup>	41,700	1,300	361,300	404,300	500	179,600	6,000	665,400
Total	13,000	70,782 <sup>d</sup>	76,788	108,718	1,370,591	1,556,097	11,836	408,803	6,419	2,066,937
1983 <sup>c</sup> Catch	71	68	390,883	338,730	1,122,976	1,852,589	15,007	192,947	5	2,060,687
Escapement	9,000	8,600	40,000	100	358,000	398,100	500	128,800	2,600	547,600
Total	9,071	8,668	430,883	338,830	1,480,976	2,250,689	15,507	321,747	2,605	2,608,287
1984 <sup>c</sup> Catch	0	1,746	409,883	333,832	637,400	1,381,115	31,447	118,756	48	1,533,112
Escapement	16,000	31,100	22,300	0	414,000	436,300	700	251,000	600	735,700
Catch	16,000	32,846	432,183	333,832	1,051,400	1,817,415	32,147	369,756	648	2,268,812
1985 <sup>c</sup> Catch	333	5,090	508,887	469,267	821,312	1,799,466	4,519	703,546	0	2,512,954
Escapement	12,600	45,500	22,700	0	451,500	474,200	700	314,800	3,700	851,500
Total	12,933	50,590	531,587	469,267	1,272,812	2,273,666	5,219	1,018,346	3,700	3,364,454

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**Table 3.-Page 4 of 7.**

Year	Outer Port Heiden <sup>a</sup> and Cinder River	Inner Port Heiden	Ilnik	Three Hills	Bear River <sup>b</sup>	Combined Ilnik, Three Hills, & Bear R. Sections	Port Moller Bight & Herendeen- Moller Bay	Nelson Lagoon	Caribou Flats & Black Hills	Northern District Totals
1986 <sup>c</sup> Catch	689	38,042	560,339	588,501	938,177	2,087,017	1,294	178,401	2	2,305,445
Escapement	25,700	26,400	66,800	100	279,400	346,300	300	117,900	2,300	518,900
Total	26,389	64,442	627,139	588,601	1,217,577	2,433,317	1,594	296,301	2,302	2,824,345
1987 <sup>c</sup> Catch	214	2,359	506,916	212,435	213,958	933,309	679	128,471	62	1,065,094
Escapement	15,300	28,300	30,700	0	266,700	297,400	700	155,700	8,700	506,100
Total	15,514	30,659	537,616	212,435	480,658	1,230,709	1,379	284,171	8,762	1,571,194
1988 <sup>c</sup> Catch	690	9,951	494,616	258,982	494,951	1,248,549	3,850	186,616	0	1,449,656
Escapement	2,000	35,900	26,900	0	347,500	374,400	400	142,500	6,900	562,100
Total	2,690	45,851	521,516	258,982	842,451	1,622,949	4,250	329,116	6,900	2,011,756
1989 <sup>c</sup> Catch	3,044	11,365	149,399	599,588	557,100	1,306,087	5,670	324,979	14,266	1,665,411
Escapement	4,000	11,200	16,600	100	487,000	503,700	500	206,800	7,600	733,800
Total	7,044	22,565	165,999	599,688	1,044,100	1,809,787	6,170	531,779	21,866	2,399,211
1990 <sup>c</sup> Catch	1,246	9,701	753,030	189,870	876,248	1,819,148	4,250	410,417	13,265	2,258,027
Escapement	14,000	26,800	35,700	100	564,300	600,100	400	269,200	5,700	916,200
Total	15,246	36,501	788,730	189,970	1,440,548	2,419,248	4,650	679,617	18,965	3,174,227
1991 <sup>c</sup> Catch	296	5,439	610,975	253,880	1,044,660	1,909,515	4,587	273,960	16,382	2,210,179
Escapement	47,400	26,500	135,000	200	681,200	816,400	500 <sup>d</sup>	279,200	9,000	1,179,000
Total	47,696	31,939	745,975	254,080	1,725,860	2,725,915	5,087 <sup>d</sup>	553,160	25,382	3,389,179
1992 <sup>c</sup> Catch	4,472	8,023	740,992	959,223	1,398,253	3,098,468	5,911	378,706	878	3,496,458
Escapement	15,200	33,100	45,100	0	471,200	516,300	200	179,700	16,600	761,100
Total	19,672	41,123	786,092	959,223	1,869,453	3,614,768	6,111	558,406	17,478	4,257,558
1993 <sup>c</sup> Catch	8,903	518	868,790	411,277	2,041,716	3,321,783	10,045	452,842	4,005	3,798,096
Escapement	20,000 <sup>d</sup>	50,000 <sup>d</sup>	70,000	300	501,900	572,200	400	267,200	10,200	920,000
Total	28,903	50,518 <sup>d</sup>	938,790	411,577	2,543,616	3,893,983	10,445	720,042	14,205	4,718,096

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**Table 3.-Page 5 of 7.**

Year	Outer Port Heiden <sup>a</sup> and Cinder River	Inner Port Heiden	Ilnik	Three Hills	Bear River <sup>b</sup>	Combined Ilnik, Three Hills, & Bear R. Sections	Port Moller Bight & Herendeen- Moller Bay	Nelson Lagoon	Caribou Flats & Black Hills	Northern District Totals
1994 <sup>c</sup> Catch	5,197	633	838,945	481,600	1,089,249	2,409,794	2,244	329,212	1,202	2,748,282
Escapement	83,400	44,900	75,300	0	581,200	656,500	400	333,400	5,100	1,123,700
Total	88,597	45,533	914,245	481,600	1,670,449	3,066,294	2,644	662,612	6,302	3,871,982
1995 <sup>c</sup> Catch	1,280	768	320,473	931,168	1,536,039	2,787,680	5,936	448,281	3,569	3,247,514
Escapement	47,500	85,600	39,000	400	430,400	469,800	2,000	338,700	3,700	947,300
Total	48,780	86,368	359,473	931,568	1,966,439	3,257,480	7,936	786,981	7,269	4,194,814
1996 <sup>c</sup> Catch	3,726	3,603	612,761	188,556	592,413	1,393,730	1,546	445,335	5,077	1,853,017
Escapement	60,000 <sup>d</sup>	60,000	62,500	0	431,100	493,600	6,000	257,000	8,500	885,100
Total	63,726	63,603	675,261	188,556	1,023,513	1,887,330	7,546	702,335	13,577	2,738,117
1997 <sup>c</sup> Catch	8,342	2,222	762,638	263,089	642,461	1,668,188	8,693	384,370	20,741	2,092,556
Escapement	33,000	40,000 <sup>d</sup>	83,000	400	398,000	481,400	900	190,100	6,100	751,500
Total	41,342	42,222 <sup>d</sup>	845,638	263,489	1,040,461	2,149,588	9,593	574,470	26,841	2,844,056
1998 <sup>c</sup> Catch	8,321	249	470,560	106,856	251,327	828,743	799	161,441	36,684	1,036,237
Escapement	57,000	59,200	50,600	300	469,100	520,000	700	165,300	7,700	809,900
Total	65,321	59,449	521,160	107,156	720,427	1,348,743	1,499	326,741	44,384	1,846,137
1999 <sup>c</sup> Catch	19,004	877	617,330	200,239	557,805	1,375,374	2,397	237,293	25,324	1,660,269
Escapement	12,400	76,000	75,000	100	408,000	483,100	2,500	223,300	11,300	808,600
Total	31,404	76,877	692,330	200,339	965,805	1,858,474	4,897	460,593	36,624	2,468,869
2000 <sup>c</sup> Catch	7,984	68	769,548	403,470	473,631	1,646,649	4,090	193,694	13,951	1,866,436
Escapement	51,000	184,600	95,000	0	275,000	370,000	500	182,700	8,400	797,200
Total	58,984	184,668	864,548	403,470	748,631	2,016,649	4,590	376,394	22,351	2,663,636
2001 <sup>c</sup> Catch	5,482	0	205,041	165,878	527,284	898,203	1,975	174,363	16,263	1,096,286
Escapement	33,000	115,000	59,000	300	351,000	410,300	500	207,100	8,600	774,500
Total	38,482	115,000	264,041	166,178	878,284	1,308,503	2,475	381,463	24,863	1,870,786

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**Table 3.-Page 6 of 7.**

Year	Outer Port Heiden <sup>a</sup> and Cinder River	Inner Port Heiden	Ilnik	Three Hills	Bear River <sup>b</sup>	Combined Ilnik, Three Hills, & Bear R. Sections	Port Moller Bight & Herendeen- Moller Bay	Nelson Lagoon	Caribou Flats & Black Hills	Northern District Totals
2002 <sup>c</sup> Catch	1,548	111	121,054	251,377	596,270	968,701	1,022	325,904	35,744	1,333,030
Escapement	11,500	54,100	43,000	650	324,000	367,650	1,500	338,400	12,000	785,150
Total	13,048	54,211	164,054	252,027	920,270	1,336,351	2,522	664,304	47,744	2,118,180
2003 <sup>c</sup> Catch	2,775	0	267,495	238,674	491,857	998,026	44	373,252	40,126	1,414,223
Escapement	102,700	114,000	69,000	300	432,000	501,300	500	364,211	11,100	1,093,811
Total	105,475	114,000	336,495	238,974	923,857	1,499,326	544	737,463	51,226	2,508,034
2004 <sup>c</sup> Catch	0	0	1,115,036	63,935	611,147	1,790,118	0	527,637	17,604	2,335,359
Escapement	58,050	103,700	82,000	600	467,000	549,600	2,250	515,397	17,900	1,246,897
Total	58,050	103,700	1,197,036	64,535	1,078,147	2,339,718	2,250	1,043,034	35,504	3,582,256
2005 <sup>c</sup> Catch	116	1,835	1,370,001	193,621	1,030,989	2,594,611	12	334,702	9,971	2,941,247
Escapement	141,000	113,100	154,000	5,700	655,300	815,000	500	303,000	47,500	1,420,100
Total	141,116	114,935	1,524,001	199,321	1,686,289	3,409,611	512	637,702	57,471	4,361,347
2006 <sup>c</sup> Catch	0	1,151	1,317,901	153,343	576,552	2,047,796	0	255,265	8,430	2,312,642
Escapement	101,100	142,610	88,000	1,800	493,000	582,800	3,000	226,000	7,530	1,063,040
Total	101,100	143,761	1,405,901	155,143	1,069,552	2,630,596	3,000	481,265	15,960	3,375,682
1987-2006 Average <sup>c</sup>										
Catch	4,132	2,944	645,675	326,353	780,196	1,752,224	3,188	317,337	14,177	2,094,001
Escapement	45,478	70,231	66,770	563	451,745	519,078	1,218	257,245	11,007	904,255
Total	49,610	73,174	712,445	326,916	1,231,941	2,271,301	4,405	574,582	25,184	2,998,256
1997-2006 Average <sup>c</sup>										
Catch	5,357	651	701,660	204,048	575,932	1,481,641	1,903	296,792	22,484	1,808,829
Escapement	60,075	100,231	79,860	1,015	427,240	508,115	1,285	271,551	13,813	955,070
Total	65,432	100,882	781,520	205,063	1,003,172	1,989,756	3,188	568,343	36,297	2,763,898

-continued-

**Table 3.-Page 7 of 7.**

Year	Outer Port Heiden <sup>a</sup> and Cinder River	Inner Port Heiden	Ilnik	Three Hills	Bear River <sup>b</sup>	Combined Ilnik, Three Hills, & Bear R. Sections	Port Moller Bight & Herendeen- Moller Bay	Nelson Lagoon	Caribou Flats & Black Hills	Northern District Totals
2002-2006 Average <sup>c</sup>										
Catch	888	619	838,297	180,190	661,363	1,679,850	216	363,352	22,375	2,067,300
Escapement	82,870	105,502	87,200	1,810	474,260	563,270	1,550	349,402	19,206	1,121,800
Total	83,758	106,121	925,497	182,000	1,135,623	2,243,120	1,766	712,754	41,581	3,189,100

Note: catch numbers do not include test fish harvest or fish retained for personal use.

<sup>a</sup> Outer Port Heiden Section catches occurred only between 1986 and 1989. This section has been closed since 1989.

<sup>b</sup> Escapement includes all sockeye systems, mainly Bear and Sandy Rivers combined with post weir estimates.

<sup>c</sup> Escapements are indexed totals except for Bear, Sandy, Ilnik, and Nelson Rivers where weir and tower counts are used.

<sup>d</sup> These figures are extrapolated estimates.

<sup>e</sup> Ilnik Section and Three Hills Section combined.

**Table 4.-**Sockeye salmon escapement goals and objectives by system, the 1997-2006 average escapement, and the 2006 escapement within the vicinity of the Nelson Lagoon to Strogonof Point reach.

Year	Nelson River		Bear River		Sandy River		Ilnik River		Meshik River		Cinder River	
	Escapement <sup>a</sup>	Goal	Escapement	Goal	Escapement	Goal	Escapement <sup>b</sup>	Goal	Escapement <sup>c</sup>	Goal	Escapement <sup>d</sup>	Goal
1986			272,500						26,400		25,700	
1987			258,000						28,300		15,300	
1988			310,000						35,900		2,000	
1989	193,300		451,000						11,200		4,000	
1990	240,700		546,800						26,800		14,000	
1991	268,400		606,000				135,000		26,500		47,400	
1992	162,300		450,000				45,000		33,100		15,200	
1993	207,200		452,000				70,000		50,000		20,000	
1994	325,300		465,000	200,000 to 250,000	115,000		75,000		44,900		83,400	
1995	329,400	100,000 to 150,000	305,000		125,000		39,000		85,600	10,000 to 20,000	47,500	6,000 to 12,000
1996	250,500		367,000		64,000		62,000		60,000		60,000	
1997	183,100		360,000		38,000		82,000	40,000 to 60,000	40,000		33,000	
1998	159,800		415,000		52,000		50,000		59,200		57,000	
1999	202,067		350,000		58,000	40,000 to 60,000	75,000		76,000		12,400	
2000	182,700		275,000		40,000		95,000		184,600		51,000	
2001	201,962		300,000		51,000		58,000		115,000		33,000	
2002	315,693		275,000		49,000		43,000		54,100		11,500	
2003	343,511		366,000		66,000		69,000		114,000		102,700	
2004	480,097	97,000 to 219,000	435,000	293,000 to 488,000	32,000		82,000		103,700		58,050	
2005	303,000		554,000		101,000		154,000		113,100		141,000	
2006	215,000		445,000		48,000		88,000		142,610		101,100	
Average <sup>e</sup>												
1997-2006	258,693		377,500		53,500		79,600		100,231		60,075	
2002-2006	331,460		415,000		59,200		87,200		105,502		82,870	

<sup>a</sup> Does not include David or Caribou Rivers.

<sup>b</sup> In 2005 and 2006 Ocean River did not flow into Ilnik Lagoon. The Ocean River escapement of 24,000 was added to Ilnik R. weir count in 2005 and 13,000 added in 2006.

<sup>c</sup> Includes all streams draining into Inner Port Heiden.

<sup>d</sup> Includes Mud Creek.

<sup>e</sup> Estimates are based on weir counts added to post weir escapement estimates. Only those years when weirs were present are included in the table.

**Table 5.-North Alaska Peninsula coho salmon catches by district and section, 1997-2006.**

Section	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006 Average
<b>Northwestern District</b>											
Dublin Bay	0	0	0	0	0	0	0	0	0	0	0
Urilla Bay	0	3,561	1,686	5,601	0	0	0	0	0	0	1,085
Swanson Lagoon	270	126	486	27	0	0	0	0	0	23	93
Bechevin Bay <sup>a</sup>	42	0	30	0	0	0	0	0	0	109	18
Izembek - Moffet Bay <sup>a</sup>	0	0	0	0	23	25	37	15	901	92	109
<i>Northwestern District Total</i>	312	3,687	2,202	5,628	23	25	37	15	901	224	1,305
<b>Northern District</b>											
Black Hills	212	533	250	259	86	335	423	356	78	140	267
Caribou Flats	0	0	0	0	0	0	0	0	0	0	0
Nelson Lagoon	32,260	33,700	8,536	25,017	2,918	6,712	30,620	29,879	46,486	66,874	28,300
Herendeen - Moller Bay <sup>b</sup>	256	78	297	19	42	29	7	0	0	0	73
Bear River	6,330	6,011	14,029	10,111	10,031	13,080	10,379	1,743	9,046	11,580	9,234
Three Hills	6,048	10,221	9,298	5,630	3,135	5,863	3,982	944	2,177	4,422	5,172
Ilnik	5,377	23,886	17,468	12,584	4,488	2,387	5,617	649	7,870	10,715	9,104
Inner Port Heiden	18,544	5,705	835	11,623	0	0	0	0	0	0	3,671
Outer Port Heiden	0	0	0	0	0	0	0	0	0	0	0
Cinder River	25,437	50,903	992	12,784	1,439	320	2,072	334	2,122	0	9,640
<i>Northern District Total</i>	94,464	131,037	51,705	78,027	22,139	28,726	53,100	33,905	67,779	93,731	65,461
North Peninsula Total	94,776	134,724	53,907	83,655	22,162	28,751	53,137	33,920	68,680	93,955	66,767

Note: catch numbers do not include test fish harvest or fish retained for personal use.

<sup>a</sup> Statistical area 311-58 was moved from the Bechevin Bay Section to the Izembek-Moffet Bay Section in 2001.

<sup>b</sup> Includes Port Moller Bight Section.



**Table 6.-**Estimated run potential of four sockeye salmon systems on the North Alaska Peninsula.

System	2002-2006 Average Escapement	Estimated Run Using R/S x Average Escapement <sup>a</sup>		
		Estimated Total Run Potential <sup>b</sup>	Estimated Range Using Using 80% Confidence Interval	
			Low	High
Bear River				
Early Run	271,000	990,000	582,000	1,397,000
Late Run	144,000	599,000	328,000	869,000
Nelson River	331,000	502,000	260,000	744,000
Sandy River	59,000	216,000	69,000	363,000
Ilnik River	87,000	318,000	88,000	549,000
Totals	892,000	2,625,000	1,327,000	3,922,000

<sup>a</sup> Run potential for Bear (early), Sandy, and Ilnik R. runs is based on the 5 year average escapement and average return per spawner of 3.65:1, which is the actual R/S for the late Bear River run from 1994-98. The Bear (late) and Nelson River runs are based on forecasts.

<sup>b</sup> Does not include production from Northern District sockeye systems, which have averaged 210,998 sockeye salmon from 2002-2006 other than Nelson, Bear, Sandy, and Ilnik rivers.

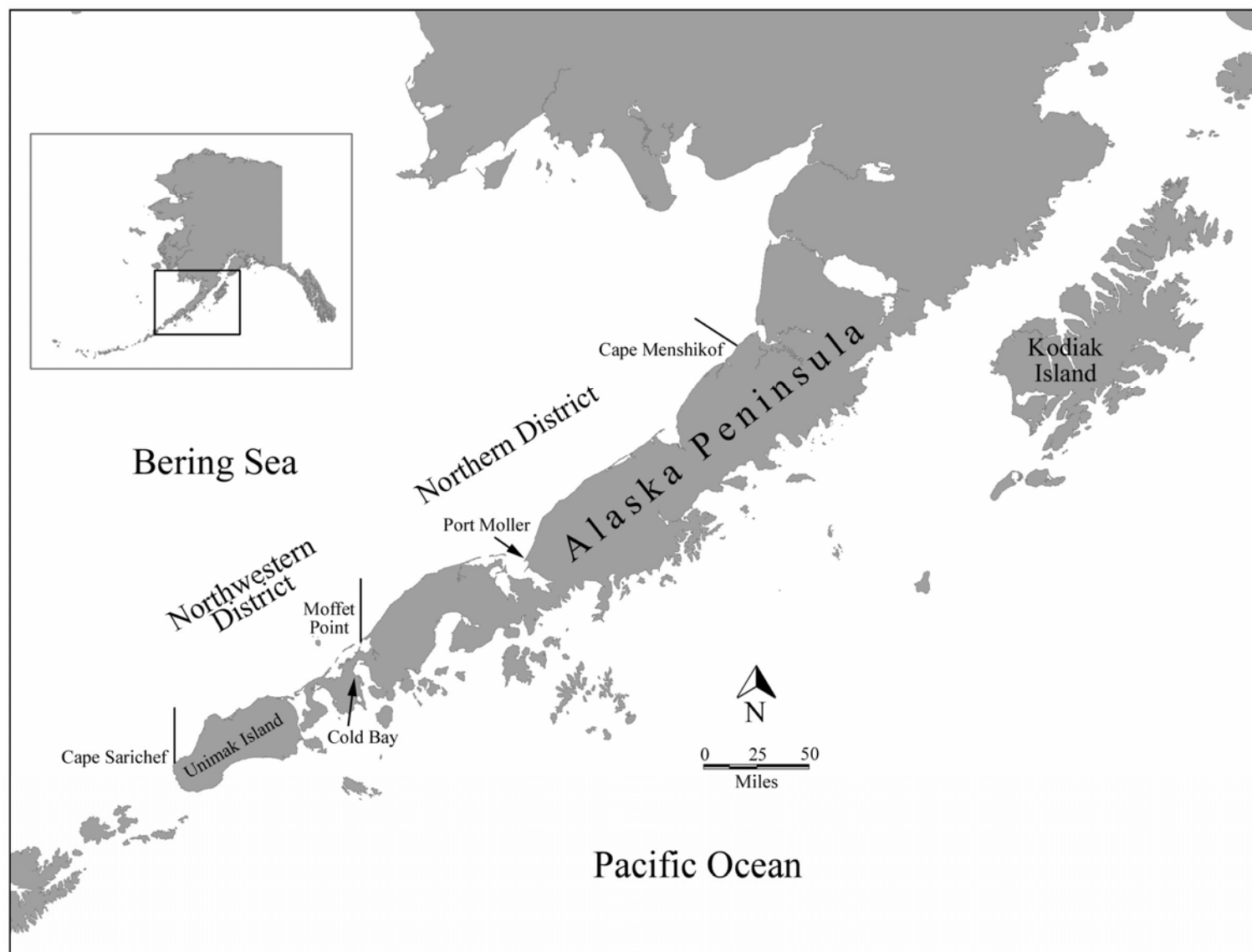
**Table 7.-Selected Northern District Alaska Board of Fisheries regulation changes.**

Year	Board of Fisheries Regulation Changes
1988	Reduced the weekly fishing period in the Ilnik Section 24 hours to 6:00 AM Monday to 6:00 P.M. Wednesday over concern for Unangashak River coho salmon and Ilnik River sockeye salmon stocks.
1990	Closed the Outer Port Heiden Section to Area M and Area T permit holders over interception concerns for migrating coho salmon into Port Heiden.  Closed the outer portion of the Ilnik Section to Area T permit holders.  Delayed the season opening in that portion of the Ilnik Section between Unangashak Bluffs and Strogonof Point from July 5 to July 15, over sockeye salmon interception concerns with Bristol Bay.
1992	The minimum gillnet mesh size restriction of 5¼" was removed in the Bear River Section after July 20. The remainder of the North Peninsula minimum 5¼" gillnet mesh restriction remains in effect.
1996	The minimum gillnet mesh restriction of 5¼" was removed in the Bear River, Port Moller Bight and Nelson Lagoon Sections to fully utilize local salmon stocks.
1998	The minimum gillnet mesh restriction of 5¼" was removed after July 24 in the Three Hills and Ilnik Sections.  The Northern District Salmon Fisheries Management Plan (5 AAC 09.369) was adopted. Early fishing time in the Ilnik Section southwest of Unangashak Bluffs between June 25 and July 4 is permitted if certain strong Ilnik River escapement levels are met. If early fishing is permitted, the maximum continuous fishing time is 24 hours, followed by at least a 24 hour closure, a sockeye salmon cap of 100,000 fish, and that portion of the Ilnik Section northeast of Unangashak Bluffs to Strogonof Point will remain closed from July 15 to July 25. Ugashik River sockeye salmon considered in the management of the Ilnik Section prior to July 20.
2001	The minimum gillnet mesh size restriction of 5¼" was removed from the entire North Peninsula to fully utilize local stocks and provide a management tool to control escapement quality.
2004	The Ilnik Section portion of the management plan was changed and early fishing was allowed beginning on June 25 in the entire Ilnik Section if Ilnik and Meshik river sockeye salmon escapement warrant. That portion of the plan with the 100,000 sockeye salmon cap, and 24 hour maximum continuous fish time, and potential extended closure of the Strogonof point area were removed from the plan. Ugashik River sockeye salmon still considered in the management of the Ilnik Section prior to July 20.

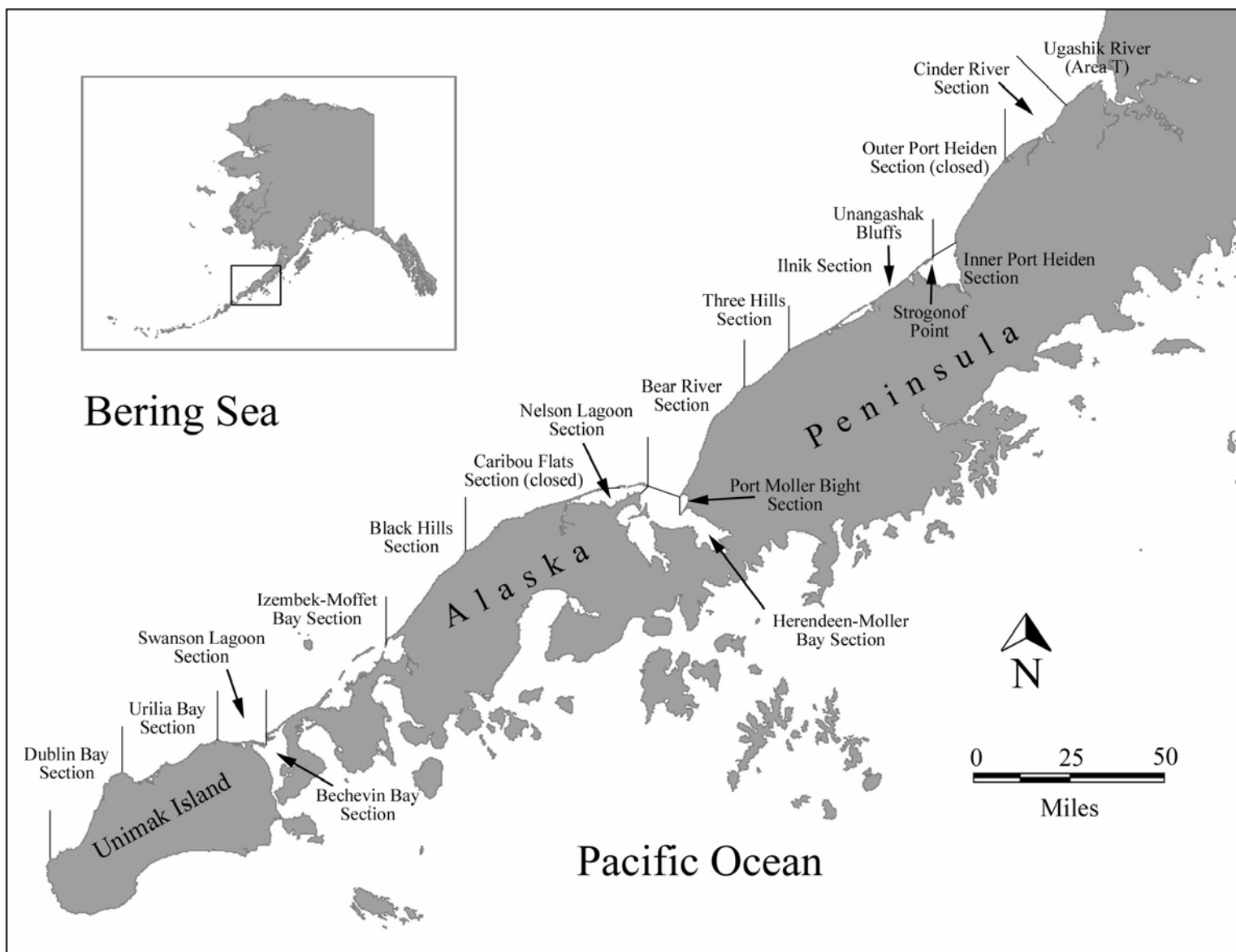
**Table 8.-**Sockeye salmon stocks used to manage three sections in the Northern District.

Section	Sockeye Salmon Stocks	
	Pre July 21	Post July 20
Bear R.	Bear R., Sandy R.	Bear R., Sandy R.
Three Hills	Bear R., Sandy R., Ilnik R.	Bear R., Sandy R.
Ilnik		
SW of Unangashak Bluffs	Ilnik R., Ugashik R. <sup>a</sup>	Bear R.
NE of Unangashak Bluffs to Strogonof Point	Ilnik R., Meshik R., Ugashik R. <sup>a</sup>	Bear R.
Nelson Lagoon	Nelson R.	Nelson R.

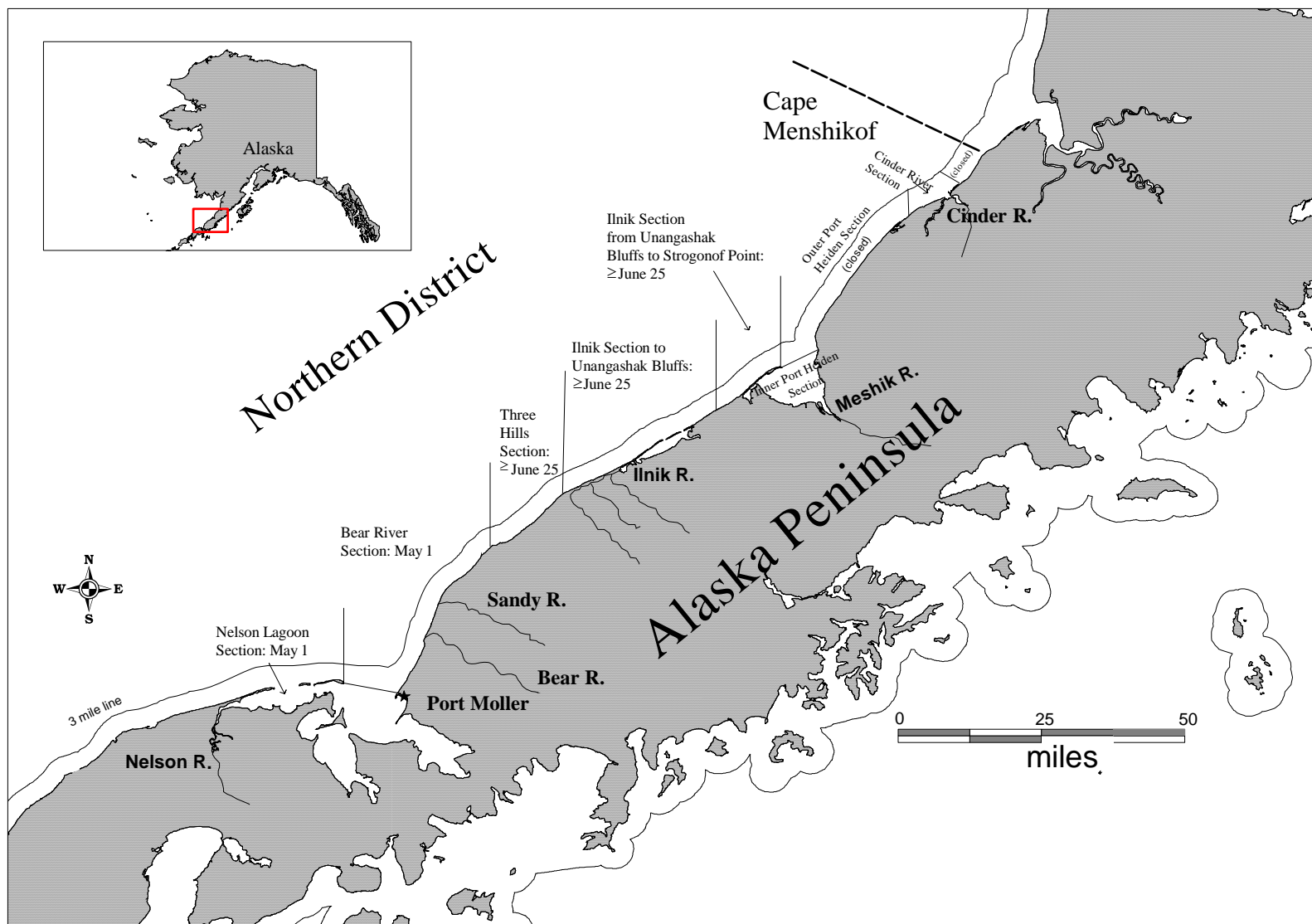
<sup>a</sup> Ugashik Rivers sockeye salmon will be considered only if a management concern exists for these stocks.



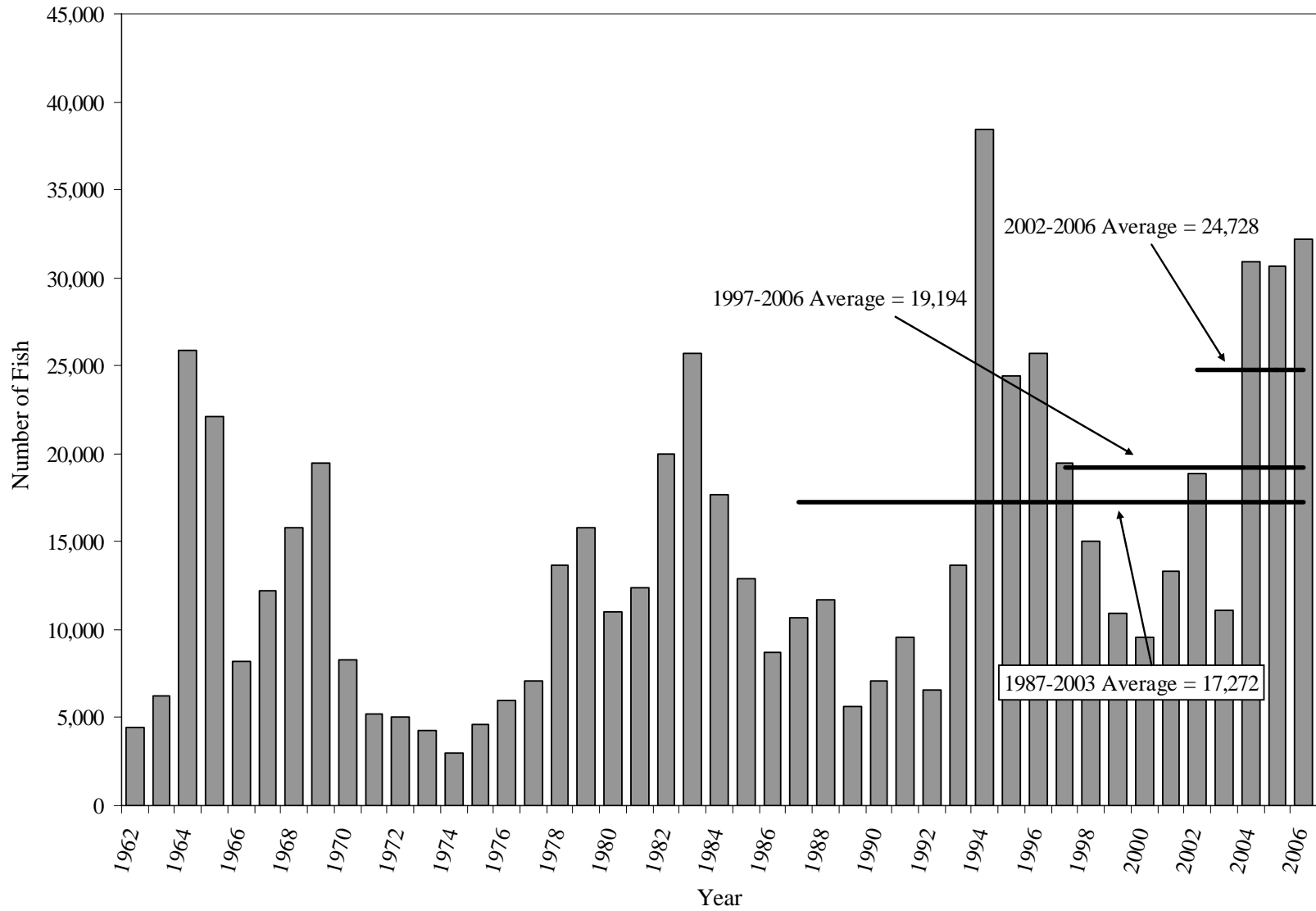
**Figure 1.-**Map of the Alaska Peninsula with the North Alaska Peninsula commercial salmon fishing districts depicted.



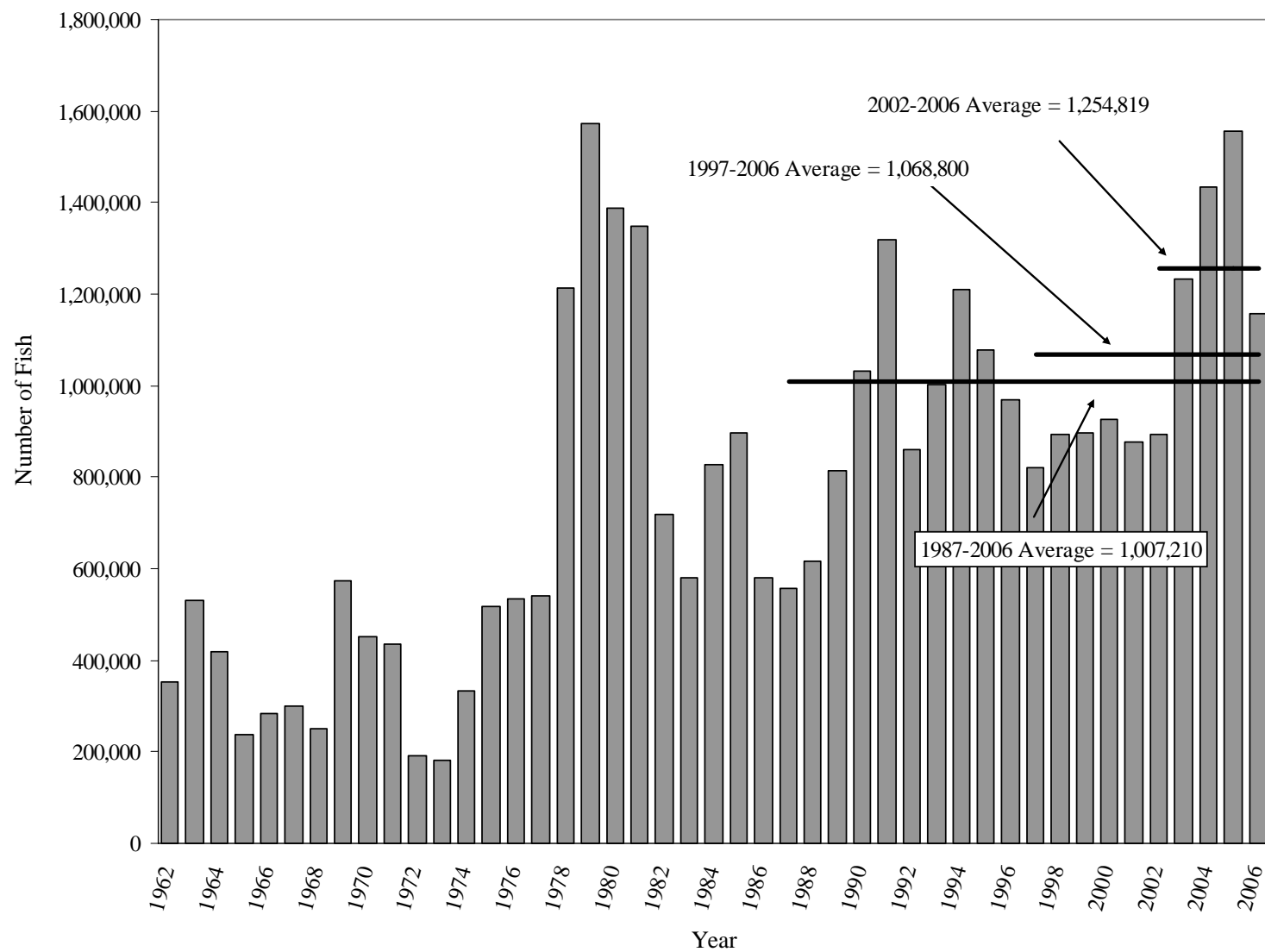
**Figure 2.-**Alaska Peninsula with North Alaska Peninsula Management Area commercial salmon fishing districts depicted.



**Figure 3.**-Map of the Nelson Lagoon to Cape Menshikof area of the Northern District with sections, commercial salmon season opening dates, and major sockeye salmon systems depicted.

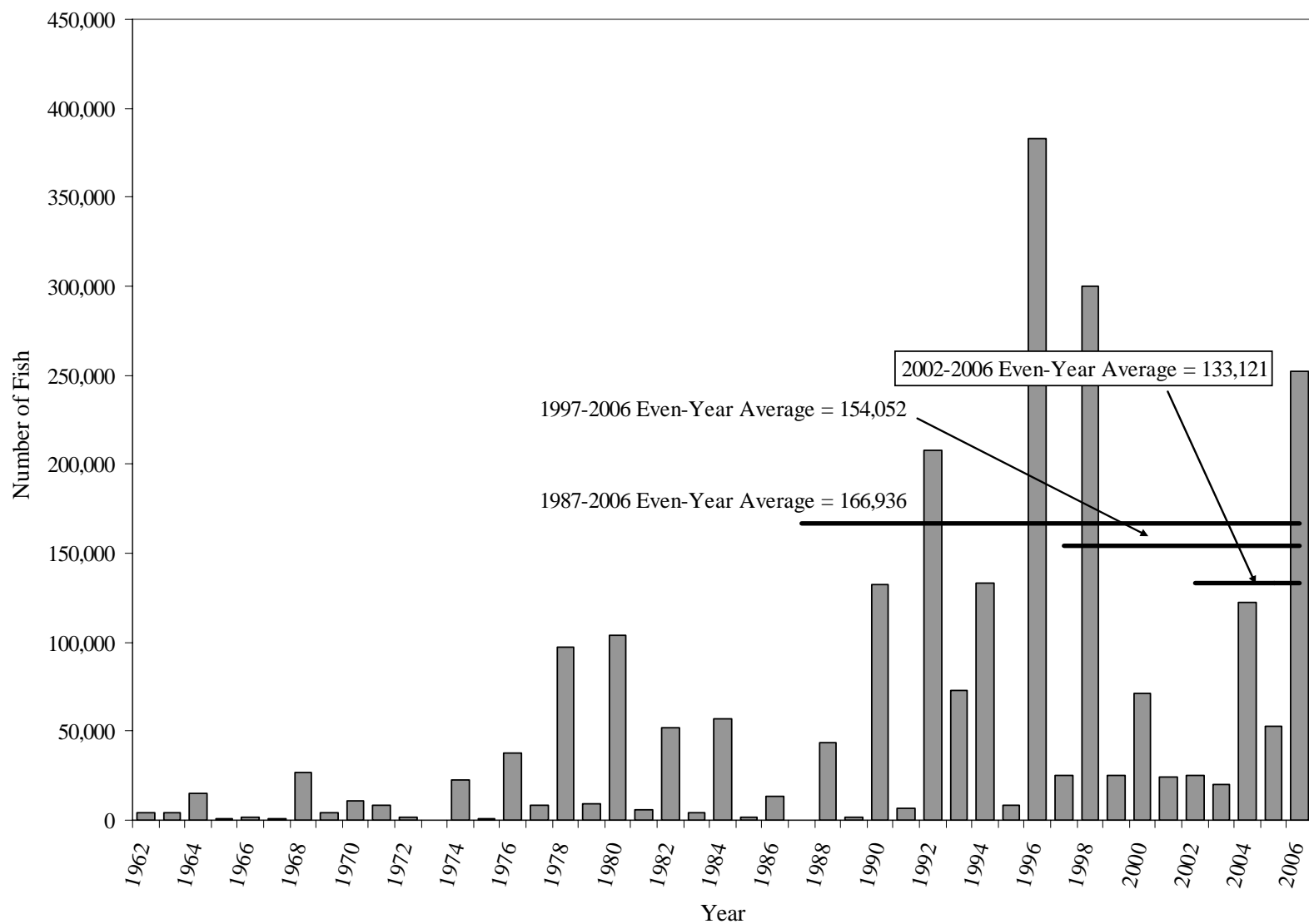


**Figure 4.-**North Alaska Peninsula Chinook salmon escapement by year, 1962-2006.

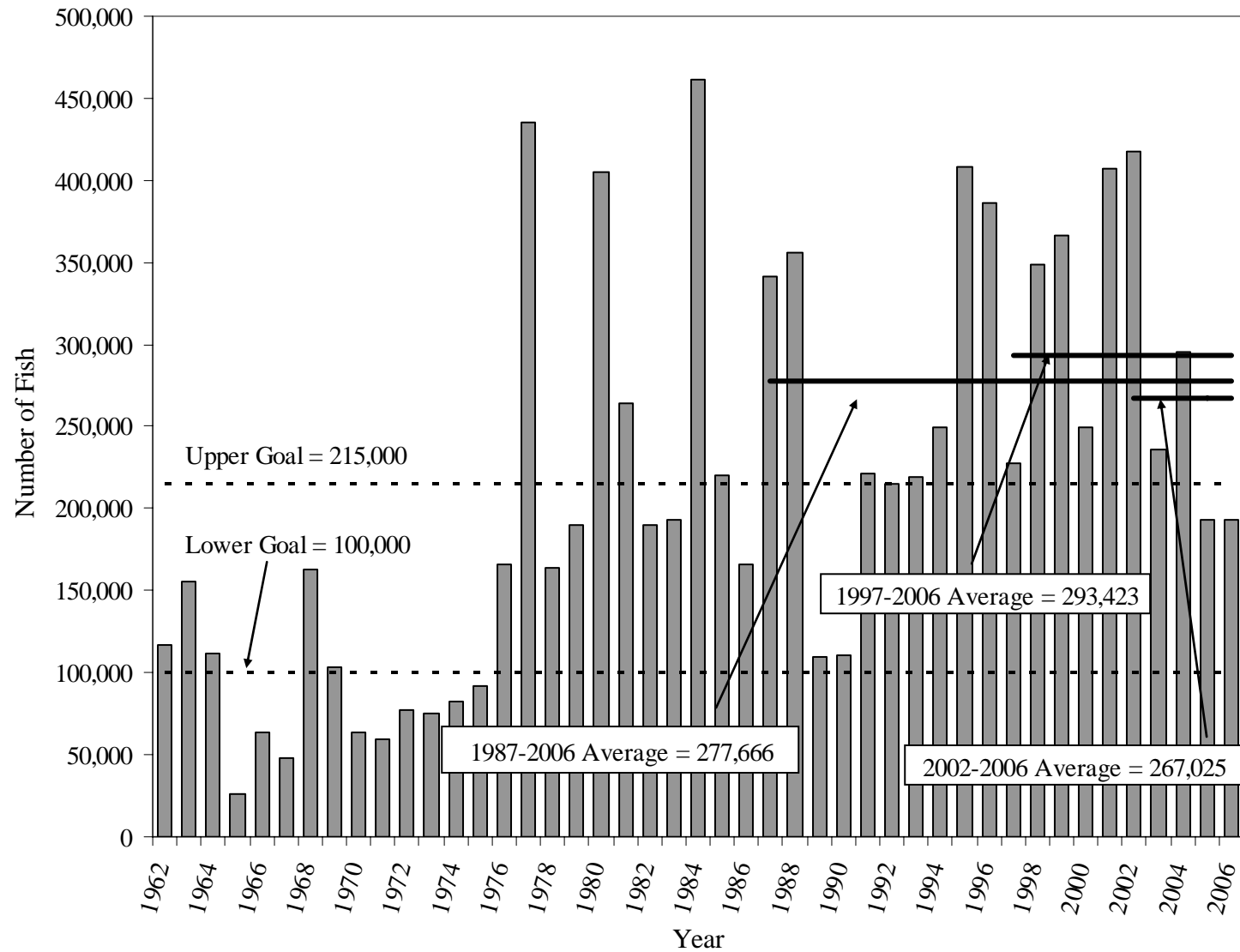


**Figure 5.-**North Alaska Peninsula sockeye salmon escapement, 1962-2006.

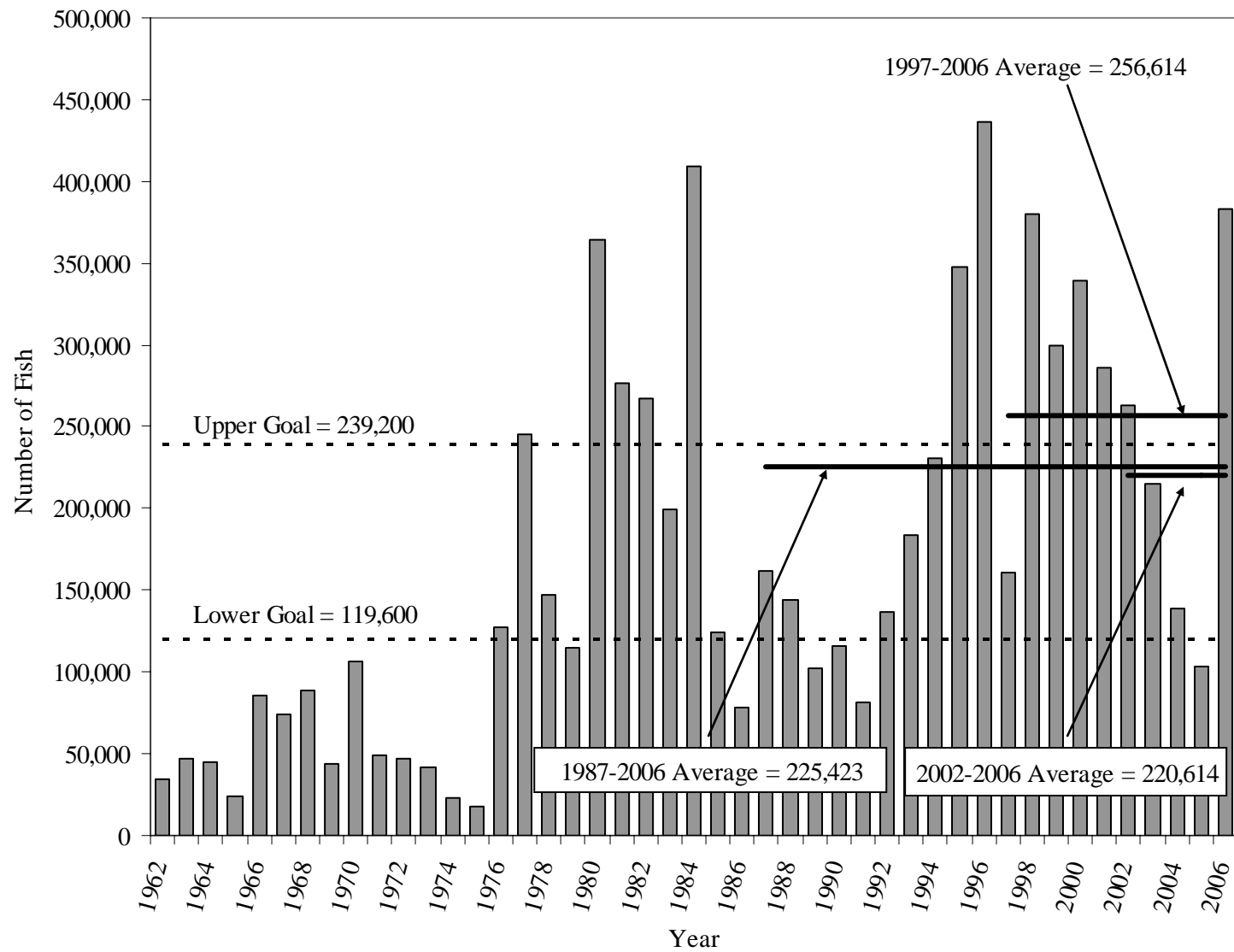




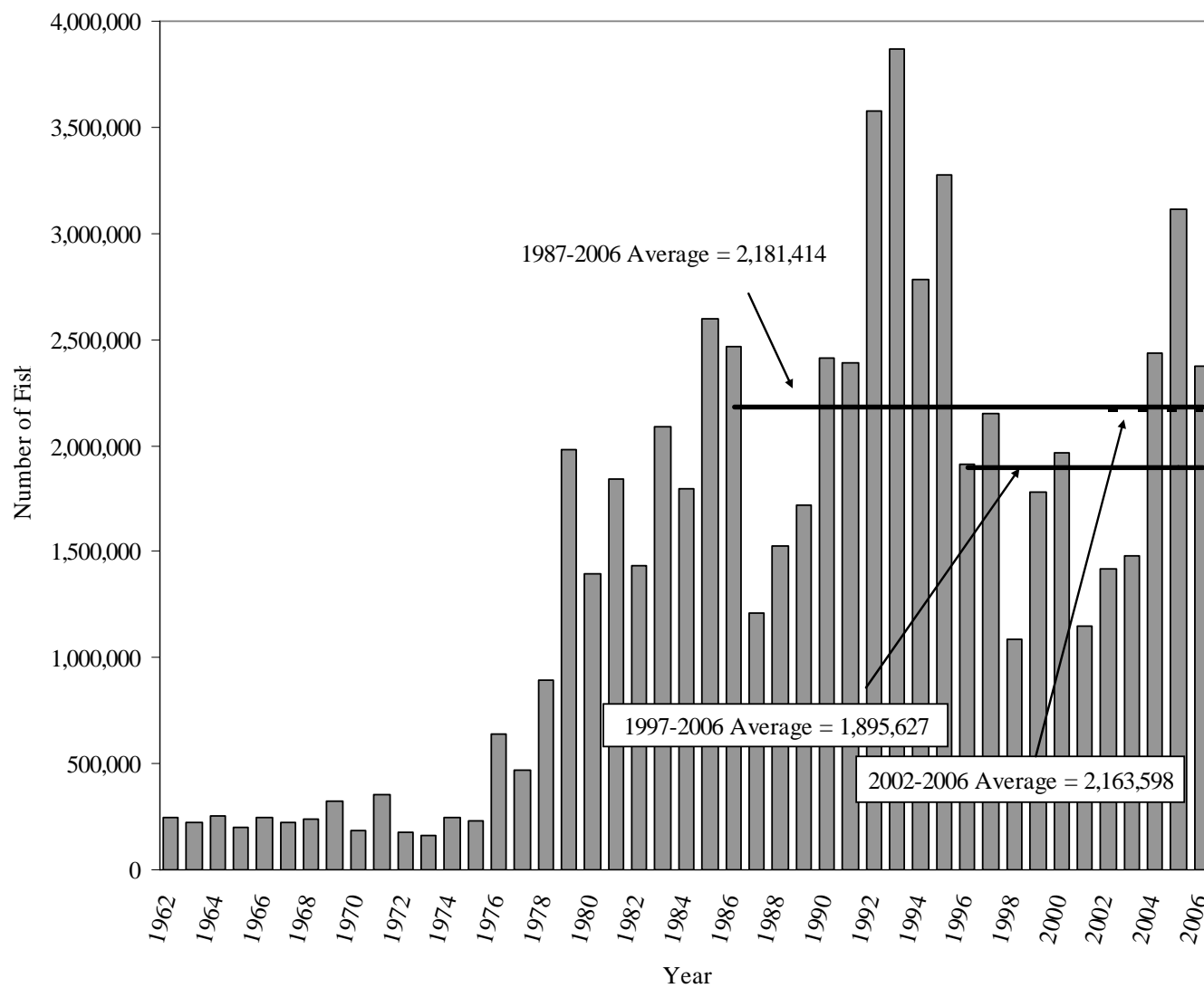
**Figure 6.-**North Alaska Peninsula pink salmon escapement by year, 1962-2006.



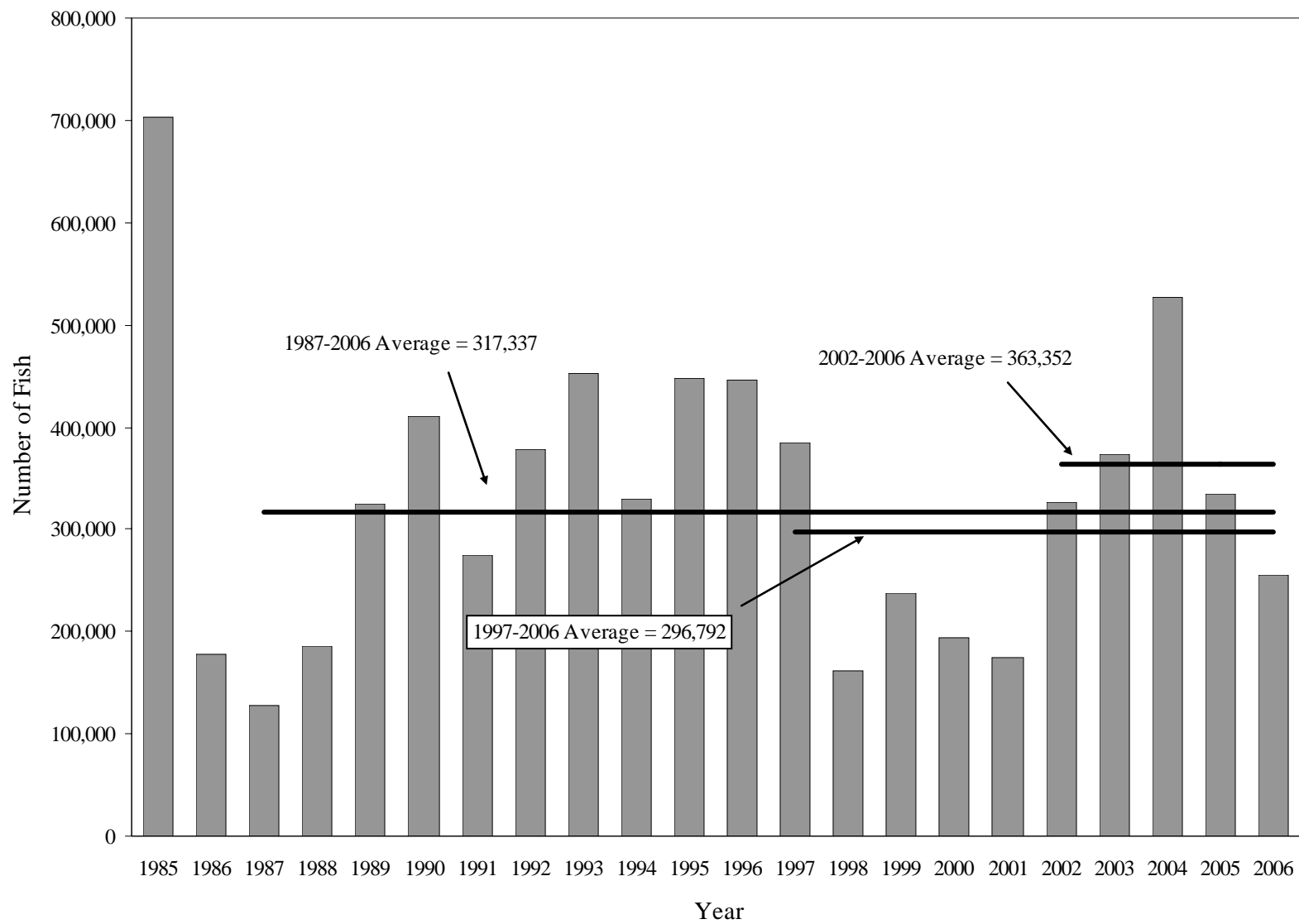
**Figure 7.-**Northwestern District chum salmon escapement by year, 1962-2006.



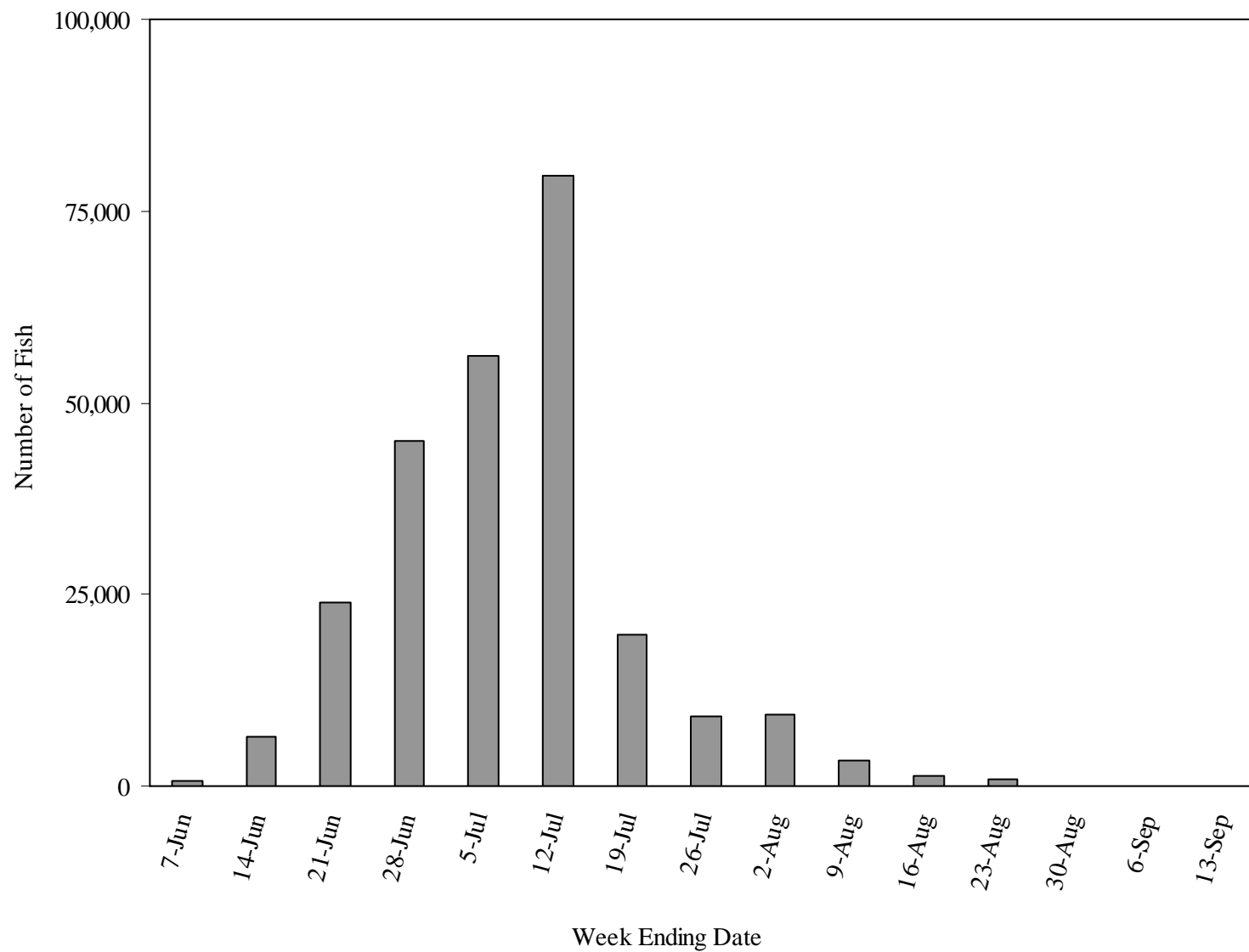
**Figure 8.-**Northern District chum salmon escapement by year, 1962-2006.



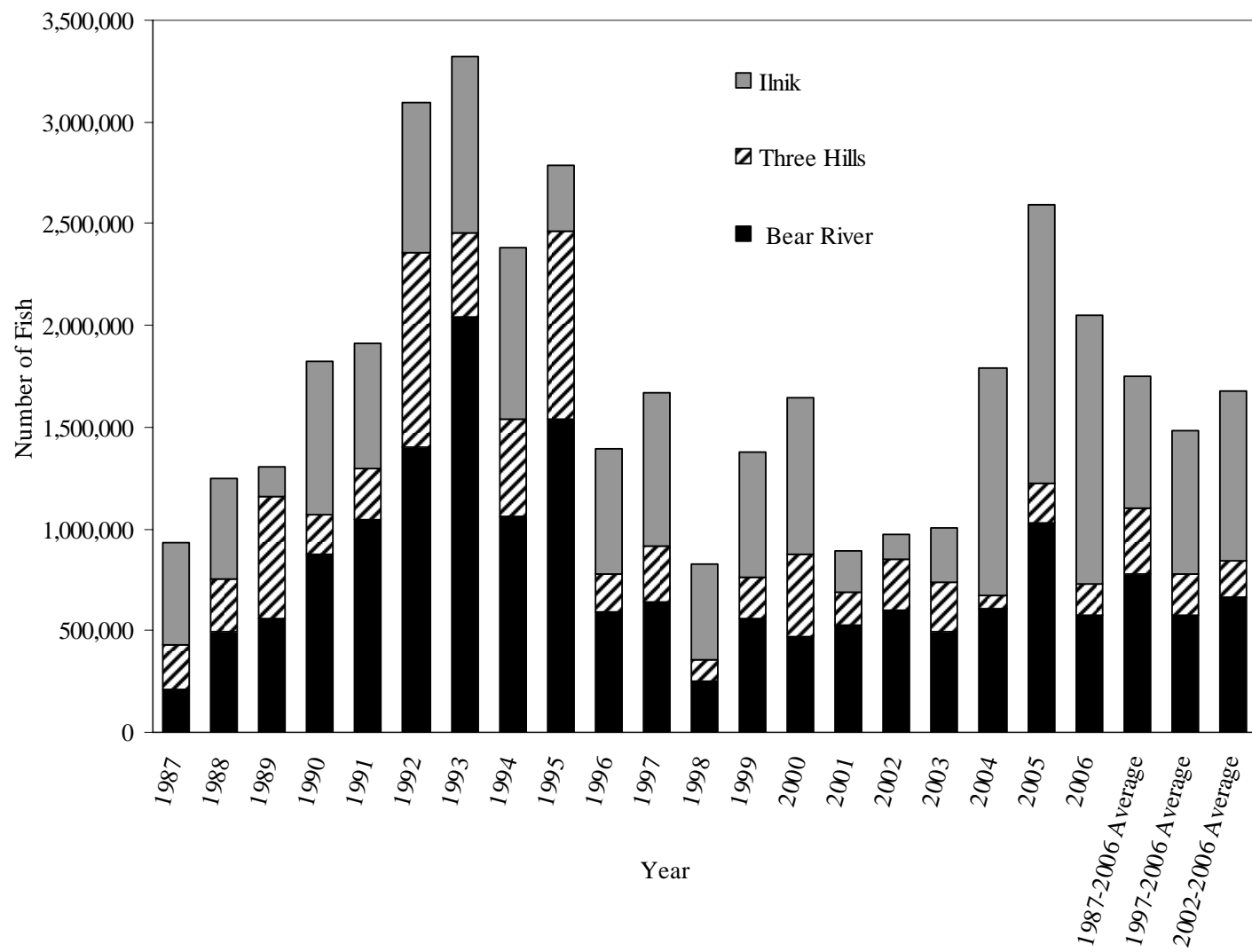
**Figure 9.**-North Alaska Peninsula commercial sockeye salmon harvest, 1962-2006.



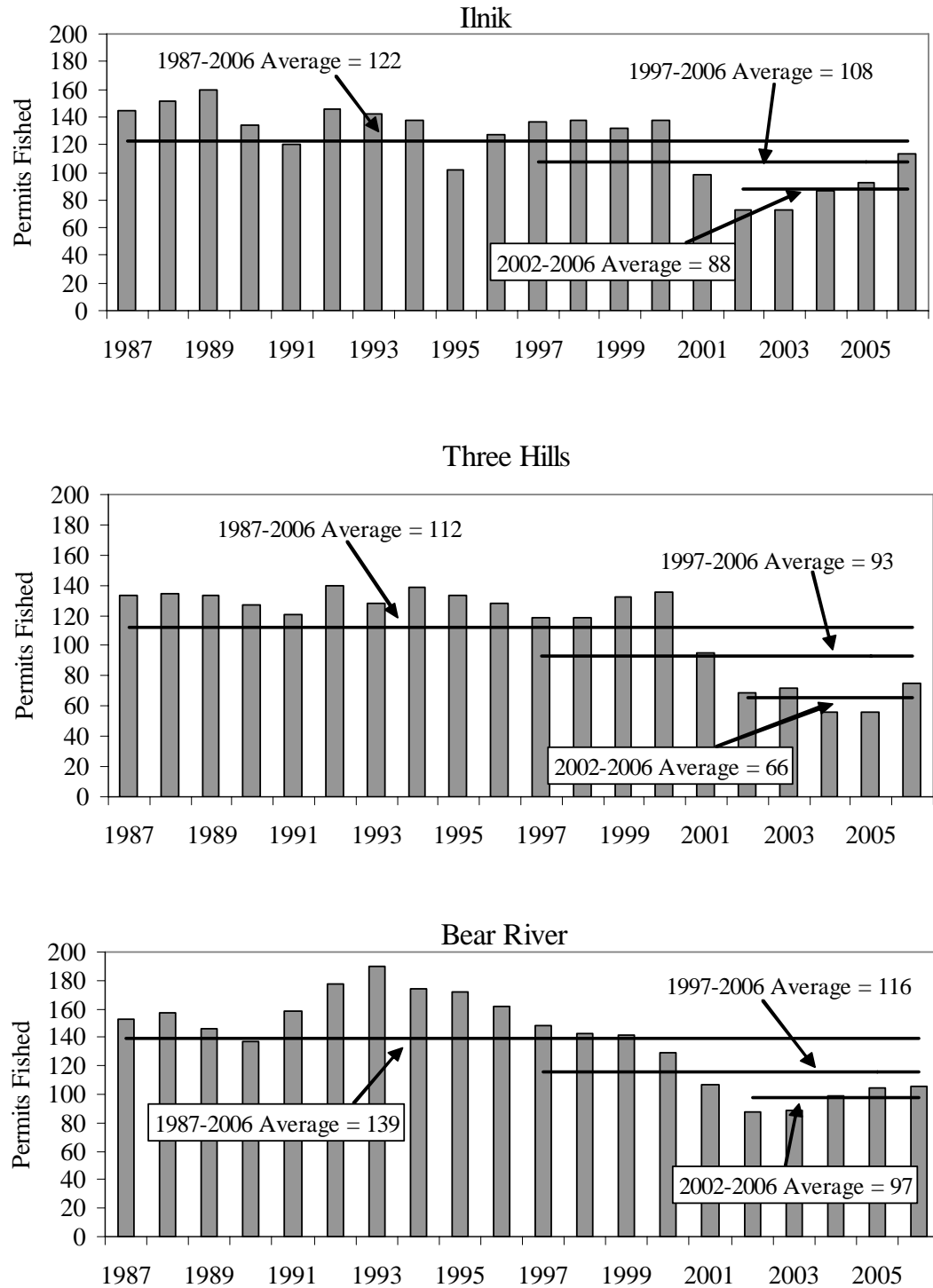
**Figure 10.-**Nelson Lagoon commercial sockeye salmon harvest, 1985-2006.



**Figure 11.-**Nelson Lagoon commercial sockeye salmon harvest by week, 2006.

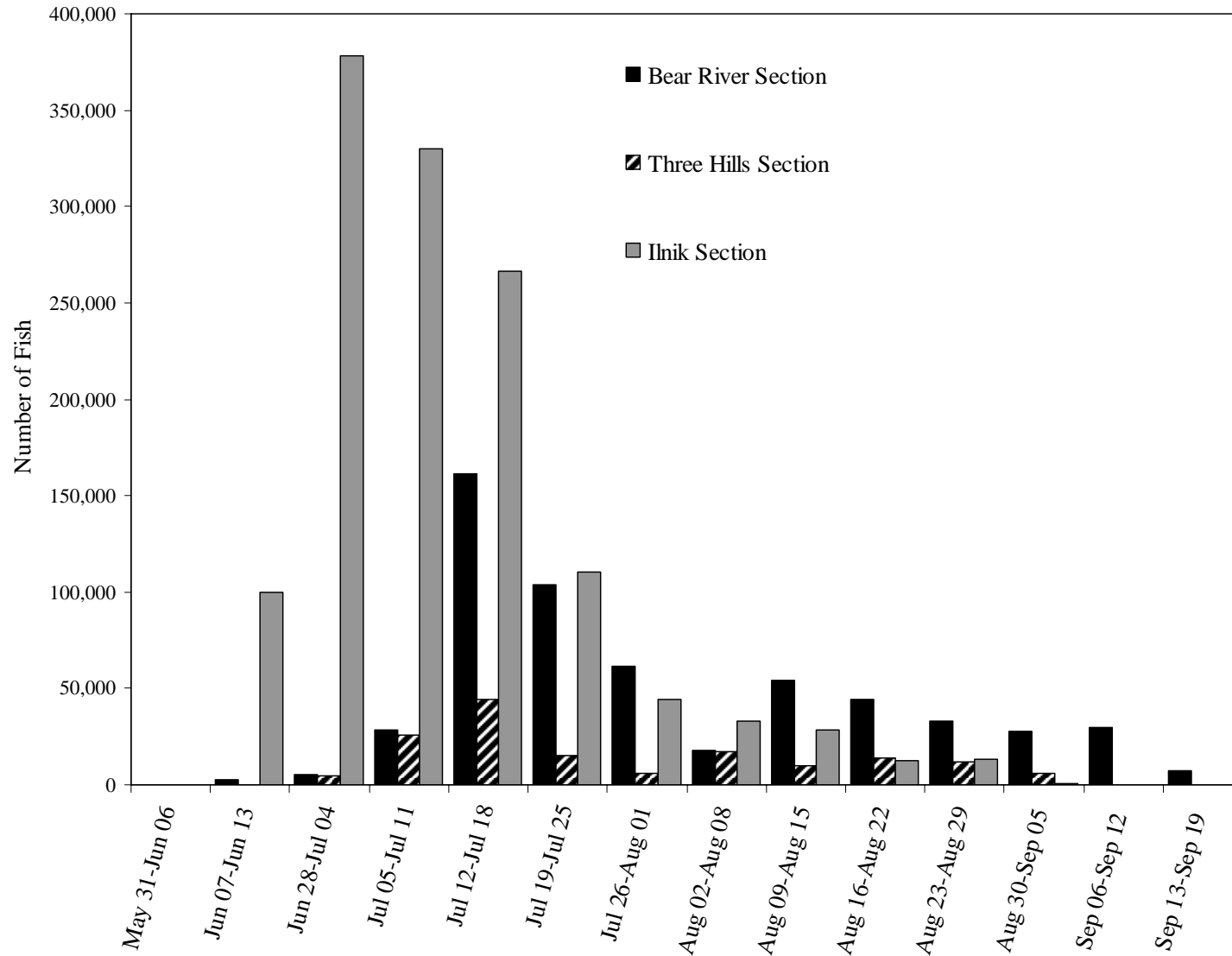


**Figure 12.-**Bear River, Three Hills, and Inik sections commercial sockeye salmon harvest, 1985-2006.

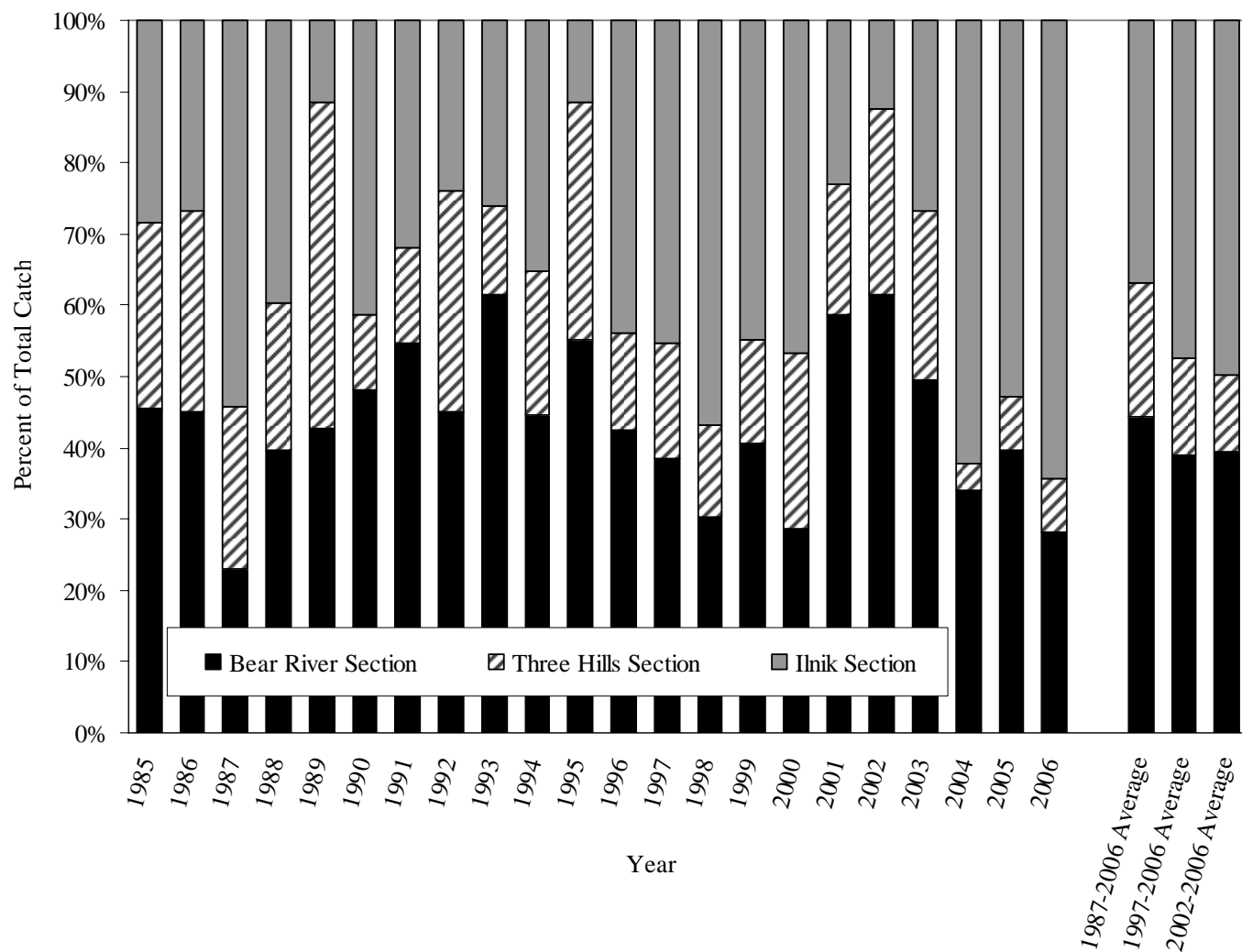


**Figure 13.-**Number of commercial salmon permits fished in the Bear River, Three Hills, and Ilnik sections, 1984-2006.

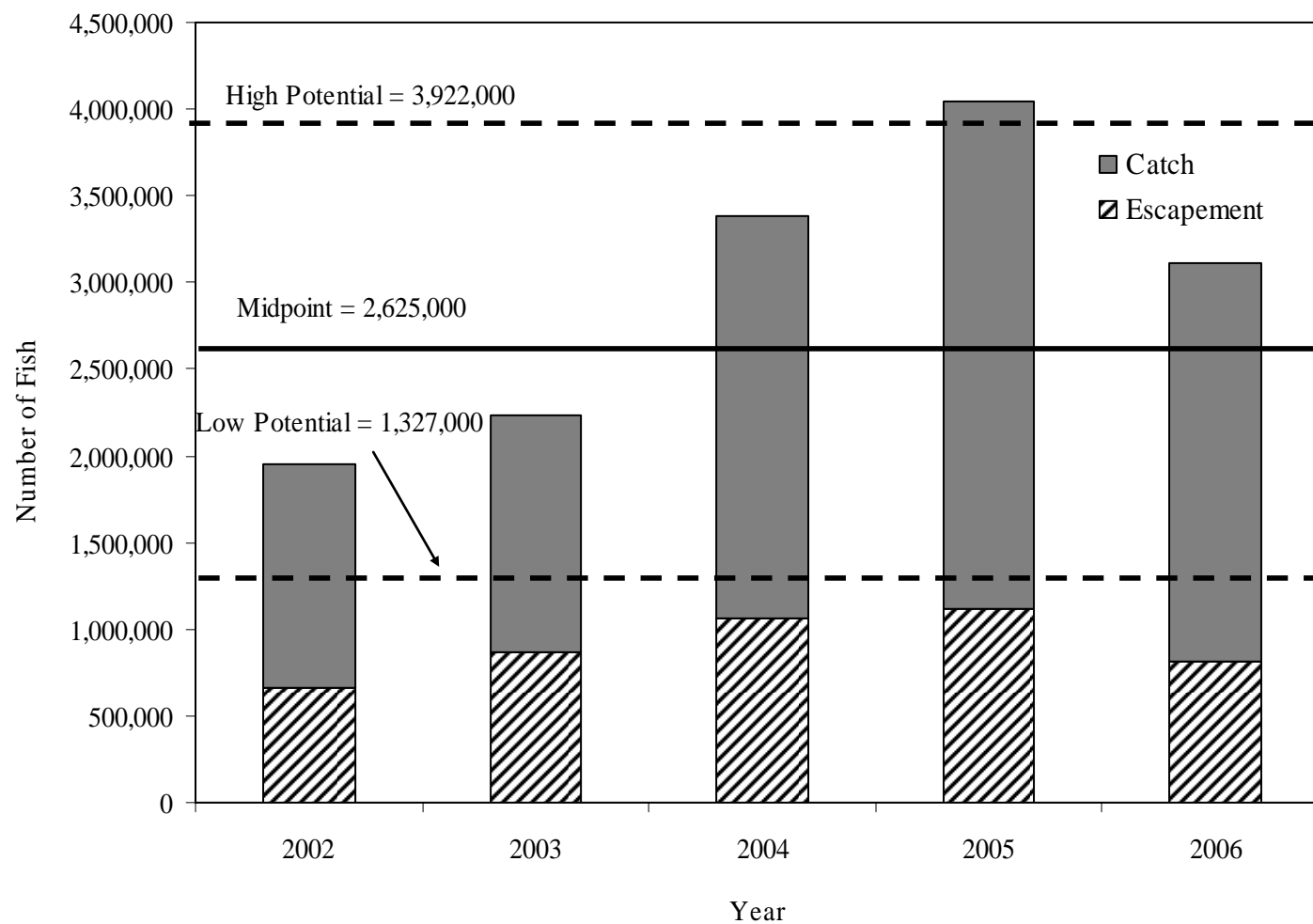




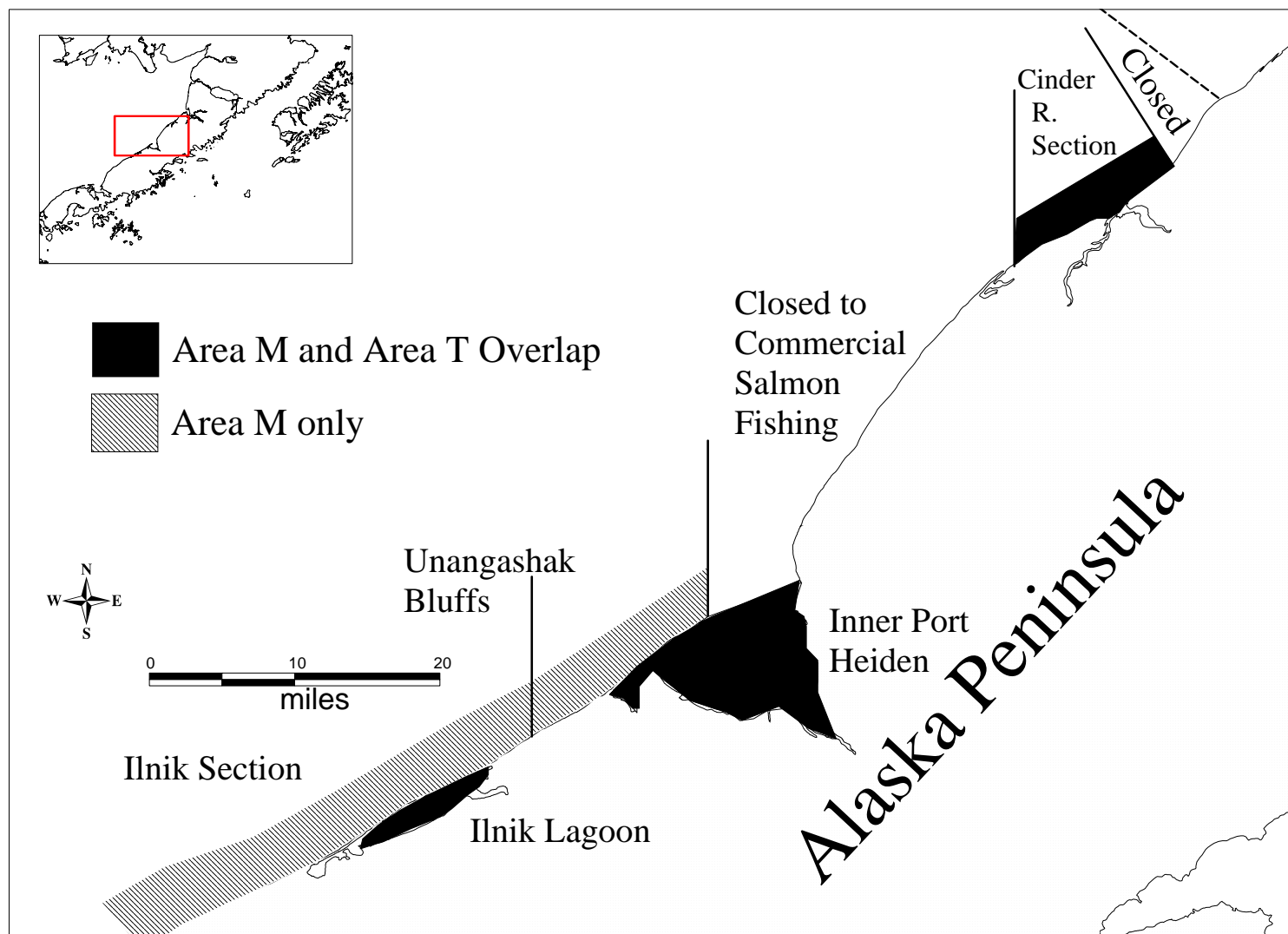
**Figure 14.-**Port Moller to Strogonof Point sockeye salmon harvest by week, 2006.



**Figure 15.**—Percent of the commercial sockeye salmon harvest from the Bear River, Three Hills, and Ilnik sections, 1985-2006.



**Figure 16.-**Nelson Lagoon to Stroganof Point actual sockeye salmon escapement and catch, and estimated run potential with low and high range estimates for 2002-2006.



**Figure 17.-**Alaska Peninsula (Area M) and Bristol Bay (Area T) commercial salmon fishing overlap areas.

## **APPENDIX A. ESCAPEMENT AND PEAK ESCAPEMENT COUNTS**

**Appendix A1.-North Alaska Peninsula estimated total escapement for Chinook, sockeye, pink, and chum salmon, and peak escapement counts for coho salmon, 2006.**

NORTHWESTERN DISTRICT						
Stream No.	Stream Name	Number of Salmon <sup>a</sup>				
		Chinook	Sockeye	Coho	Pink	Chum
URILIA BAY SECTION						
311-30.06	Divide Cr.		30			
311-30.07	Whaleback Mtn. Cr.		35,675			
311-30.08	Christianson Lgn.	0	5,800		0	0
<i>Christianson Lagoon System total</i>		<i>0</i>	<i>41,505</i>	<i>0</i>	<i>0</i>	<i>0</i>
311-30.09	Mudhole	0	750		0	0
311-30.10	Clear Lgn.	0	2,800		0	0
<i>Peterson Lagoon System total</i>		<i>0</i>	<i>3,550</i>	<i>0</i>	<i>0</i>	<i>0</i>
311-40.01	Emil's River	0	0		0	0
311-40.04	North Cr.	0	0		0	0
311-40.07	Otter Point Cr.	0	0		0	0
<b>Total Urilia Bay Section</b>		<b>0</b>	<b>45,055</b>	<b>0</b>	<b>0</b>	<b>0</b>
SWANSON LAGOON SECTION						
311-50.01	Big River	0	0		0	0
311-50.02	Swanson Lgn. System	0	376	800		8,575
<b>Total Swanson Lagoon Section</b>		<b>0</b>	<b>376</b>	<b>800</b>	<b>0</b>	<b>8,575</b>
BECHEVIN BAY SECTION						
311-60.01	St. Catherine Cove	0	0		0	0
311-60.06	Anderson's Cr.	0	0	6,400	0	47,225
311-60.07 & .08	Trader's Cove	0	0		0	
311-60.07 & .08	Trader's Cove	0	3,100		98,500	4,000
311-60.12	Warm Springs Bay	0	30		2,200	1,800
311-60.13	Hungry's Cr.	0	4,750		15,375	0
311-6018	Lampsport Lagoon	0	0		0	0
<b>Total Bechevin Bay Section</b>		<b>0</b>	<b>7,880</b>	<b>6,400</b>	<b>116,075</b>	<b>53,025</b>
IZEMBEK-MOFFET BAY SECTION						
312-20.01	Norma Bay Lakes	0	175		240	270
312-20.02	Mike's Duck Camp Cr.	0	155	270	2,200	770
312-20.03	Norma Bay, South	0	300	8,700	7,000	3,275
312-20.04	Third Bridge Cr.	0		300	2,900	0
312-20.05	Frosty Cr.	0	1,930	3,800	0	17,075
312-20.06	Blue Bill Lake	0	430		0	0
312-20.13	Outer Marker Lakes	0	2,640	200	0	0
312-20.51	Springs S Frosty Cr.	0	150		0	0
312-20.52	Second Bridge Cr.	0	3,150	450	0	0
<i>Izembek Lagoon Total</i>		<i>0</i>	<i>8,930</i>	<i>13,720</i>	<i>12,340</i>	<i>21,390</i>
312-40.01	Joshua Green River	0	28,575	600	0	98,600
312-40.02	Moffet Springs Cr.	0	850	960		9,500
312-40.03	Moffet Cr.	0	2,700	900	500	2,370
312-40.04	Unnamed	0	140		0	0
312-40.05	Unnamed	0	0		0	
<i>Moffet Bay total</i>		<i>0</i>	<i>32,265</i>	<i>2,460</i>	<i>500</i>	<i>110,470</i>
<b>Total Izembek-Moffet Bay Section</b>		<b>0</b>	<b>41,195</b>	<b>16,180</b>	<b>12,840</b>	<b>131,860</b>
<b>NORTHWESTERN DISTRICT TOTAL</b>		<b>0</b>	<b>94,506</b>	<b>23,380</b>	<b>128,915</b>	<b>193,460</b>

-continued-

Appendix A1.-Page 2 of 4.

**NORTHERN DISTRICT**

Stream No.	Stream Name	Number of Salmon <sup>a</sup>				
		Chinook	Sockeye	Coho	Pink	Chum
BLACK HILLS SECTION						
313-10.02	North Cr.	0	7,530	3,000	0	1,610
313-10.05	Cathedral River	0	0		0	0
313-10.06	Russian River	0	0		0	100
313-10.09	AMOCO Airstrip Cr.	100	0	5,000	0	0
313-10.11	Black Hills Cr.	4,500	0	6,500	0	0
313-10.14	Steelhead Cr.	5,800	0	4,000	0	0
Total Black Hills Section		10,400	7,530	18,500	0	1,710

**NELSON LAGOON SECTION**

313-30.01	David's R. (early)	0	0		0	0
313-30.01 & .04	David's R. (late)	0	4,000	1,000	0	0
313-30.02	Caribou River	0	7,000		0	500
313-30.03	Nelson (Sapsuk) River	2,516	215,000	19,000	313	14,600
<b>Total Nelson Lagoon Section</b>		<b>2,516</b>	<b>226,000</b>	<b>20,000</b>	<b>313</b>	<b>15,100</b>

**HERENDEEN-MOLLER BAY SECTION**

314-20.02	Doe Valley	0	0		0	10,000
314-20.03	Buck Valley	0	0	50	0	6,500
314-20.04	Deer Valley	0	0	600	20,000	33,200
314-20.05	Portage Valley	0	0	100	0	9,000
314-20.06	Grass Valley	0	3,000	14,000	35,000	25,000
314-20.07	Lawence Valley	0	0	20,000	3,000	47,000
314-20.08	Mine Hbr.	0	0		0	2,050
314-20.09	Coal Cr.	0	0	500	3,000	21,000
<b>Herendeen Bay total</b>		<b>0</b>	<b>3,000</b>	<b>35,250</b>	<b>61,000</b>	<b>153,750</b>
314-30.04	Mud Bay, West	0	0	1,900	2,000	6,000
314-30.05	Mud Bay, East	0	0	800	1,000	6,000
314-30.07	Head Cr., Rt Head	0	0	10	0	2,000
314-30.09	Right Head Cr.	0	0	6,200	2,000	11,000
314-30.10	Left Head Cr.	0	0	8,000	3,500	9,500
<b>Moller Bay total</b>		<b>0</b>	<b>0</b>	<b>16,910</b>	<b>8,500</b>	<b>34,500</b>
<b>Total Herendeen-Moller Bay Section</b>		<b>0</b>	<b>3,000</b>	<b>52,160</b>	<b>69,500</b>	<b>188,250</b>

**BEAR RIVER SECTION**

315-10.01	Frank's Lgn.	0	0	2,000	7,000	6,000
315-10.02	King Salmon R.	1,300	0	3,000	3,000	4,000
315-11.02	Bear River	300	445,000	2,000	6,162	120
315-12.01	Sandy River	2,500	48,000	3,000	234	5,000
<b>Total Bear River Section</b>		<b>4,100</b>	<b>493,000</b>	<b>10,000</b>	<b>16,396</b>	<b>15,120</b>

**THREE HILLS SECTION**

316-10.01	Lime Cr.	0	0	300	1,800	2,000
316-10.02	Unnamed	0	0	500	1,200	1,200
316-10.04	SW of 3-Hills	0	1,800	6,000	200	900
<b>Total Three Hills Section</b>		<b>0</b>	<b>1,800</b>	<b>6,800</b>	<b>3,200</b>	<b>4,100</b>

-continued-

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NORTHERN DISTRICT (continued)						
Stream No.	Stream Name	Number of Salmon <sup>a</sup>				
		Chinook	Sockeye	Coho	Pink	Chum
ILNIK SECTION						
316-10.05	Ocean River	0	13,000	4,000	0	0
316-20.01	Ilnik Lagoon System	57	75,000	27,000	238	3
316-20.04	Unanagashak	0	0	11,000	0	0
Total Ilnik Section		57	88,000	42,000	238	3
INNER PORT HEIDEN SECTION						
317-20.02	Charles Cr.	0	2,100		3,000	1,800
317-20.04 A & B	Red & Yellow Bluff Creeks	0	24,000		4,000	2,200
317-20.06	Highland Cr.	800	2,500	600	0	0
West Port Heiden Bay Total		800	28,600	600	7,000	4,000
317-20.07 A	Meshik River, main stem	0	37,000	47,000	12,000	18,000
317-20.07 B	Braided Cr.	2,200	8,000		0	5,000
317-20.07 C	Landlocked Cr.	0	8,000		0	0
317-20.07 D	Bluff Cr.	2,100	0		0	0
317-20.07 E	Blue Violet Cr.	0	16,000		0	13,000
317-20.07 F	Wolf Cr.	800	4,200		0	9,000
317-20.07 G	Unnamed	0	0		0	800
317-20.07 H	Shoe Cr.	0	2,100		0	15,500
317-20.07 J	Unnamed	0	0		0	300
317-20.07 K	Unnamed	0	12,000		0	9,200
317-20.07 L	Unnamed	2,000	7,000		0	4,000
317-20.07 M	Unnamed	0	2,500		0	0
317-20.07 N	Unnamed	0	8,000		0	1,000
317-20.07 O	Plenty Bear Cr.	3,000	7,000		0	9,100
317-20.07 O-A	Paddle Cr.	0	0		0	12,000
317-20.07 P	Waterfall Cr.	0	2,000		0	4,000
317-20.07 R	Rainbow Cr.	0	200		0	13,000
317-20.07 T	Cub Cr.	0	10		0	600
Meshik River total		10,100	114,010	47,000	12,000	114,500
317-20.08	Birthday Cr.	0	0		900	6,000
317-20.09	Barabara Cr.	0	0		0	0
Total Inner Port Heiden Section		10,900	142,610	47,600	19,900	124,500
OUTER PORT HEIDEN SECTION						
318-10.01	Reindeer Cr.	0	0		0	0
Total Outer Port Heiden Section		0	0	0	0	0

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**Appendix A1.-Page 4 of 4.**

**NORTHERN DISTRICT (continued)**

Stream No.	Stream Name	Number of Salmon <sup>a</sup>				
		Chinook	Sockeye	Coho	Pink	Chum
CINDER RIVER SECTION						
318-20.01	Unnamed	0	0		0	0
318-20.04	Mud Cr.	500	49,000		4,000	0
318-20.06 A	Cinder River, main stem	2,100	23,000	9,000	4,000	27,000
318-20.06 B	Unnamed	0	0		0	0
318-20.06 C	Unnamed	0	0		0	0
318-20.06 D	Lava Creek	0	22,000		0	0
318-20.06E	High Creek	0	500		0	0
318-20.06 H	Meloy Cr.	500	6,000		0	3,000
318-20.06 J	Wiggly Cr.	200	0		0	1,500
318-20.06 K	Ray Cr.	900	600		3,000	2,000
318-20.06 L	Unnamed	0	0		3,000	300
<i>Cinder River total</i>		<i>3,700</i>	<i>52,100</i>	<i>9,000</i>	<i>10,000</i>	<i>33,800</i>
Total Cinder River Section		4,200	101,100	9,000	14,000	33,800
NORTHERN DISTRICT TOTAL		32,173	1,063,040	206,060	123,547	382,583
TOTAL NORTH PENINSULA		32,173	1,157,546	229,440	252,462	576,043

<sup>a</sup> Chinook, sockeye, pink, and chum salmon numbers are estimated total escapements. Coho salmon numbers are peak counts and based on limited data.



## **APPENDIX B. SOCKEYE SALMON BROOD TABLE**

**Appendix B1.-Bear Lake late-run (post July 31) sockeye salmon brood table, 1980-2006.**

Year	Escapement	Age																	Total Return	Return/ Spawner
		0.1	3 0.2	4 1.1	5 0.3	6 1.2	7 2.1	8 0.4	9 1.3	10 2.2	11 3.1	12 1.4	13 2.3	14 3.2	15 1.5	16 2.4	17 3.3	18 3.4		
1980	238,038							0	12,754	400,014	90	54	132,036	330	0	205	17	0	545,500	2.29
1981	214,728				1,134	43,049	9,594	0	6,463	210,579	0	2	47,413	18	0	41	93	0	318,386	1.48
1982	104,503		0	0	657	1,324	1,333	0	7,344	70,269	0	91	197,258	488	0	1,259	847	0	280,870	2.69
1983	172,143	0	0	0	147	5,044	176	0	16,802	134,380	0	488	160,027	2,093	0	89	0	0	319,246	1.85
1984	108,151	0	0	0	429	2,887	19,898	0	23,787	301,375	0	185	142,790	11,014	0	1,261	0	0	503,626	4.66
1985	170,739	0	0	1	592	24,407	14,756	0	138,603	538,445	0	1,058	217,073	38	0	2,789	2,074	0	939,836	5.50
1986	98,921	0	0	172	2,512	62,610	2,269	0	77,677	412,258	0	1,252	301,036	5,751	0	416	4,290	0	870,243	8.80
1987	83,395	0	0	0	910	77,886	17,721	57	19,211	451,063	1,000	321	490,594	25,598	0	1,909	2,341	0	1,088,611	13.05
1988	140,660	0	0	2,101	256	15,096	29,363	77	18,515	370,999	0	109	250,503	224	0	2,886	143	0	690,272	4.91
1989	204,804	0	0	2,599	1,932	6,504	40,756	0	52,714	638,148	0	2,223	322,645	1,191	0	439	67	0	1,069,218	5.22
1990	262,946	0	0	0	1,037	35,887	11,911	82	77,905	795,302	0	94	250,526	13,215	0	751	1,370	0	1,188,080	4.52
1991	173,913	0	0	1,123	211	39,738	15,637	90	32,615	192,725	146	979	91,586	1,564	0	0	1	0	376,415	2.16
1992	195,830	0	0	247	741	7,789	19,961	226	44,890	356,357	0	0	73,155	339	0	44	215	0	503,964	2.57
1993	197,988	0	189	122	7,940	6,631	30,910	1	6,601	366,291	123	184	114,578	5,819	0	100	1,299	32	540,788	2.73
1994	204,441	0	316	1,705	312	20,444	21,371	0	18,139	566,411	0	55	156,901	1,098	32	714	229	0	787,727	3.85
1995	107,961	0	24	1,279	497	30,943	27,553	0	47,482	455,680	0	860	147,895	32	0	1,149	351	0	713,745	6.61
1996	119,629	0	217	1,208	1,287	37,755	8,026	32	15,639	271,516	0	301	143,781	19,931	0	423	2,901	0	503,017	4.20
1997	145,311	0	0	527	1,095	5,718	28,904	50	2,606	198,531	201	196	103,653	7,179	0	0	10	0	348,670	2.40
1998	193,420	0	2,749	202	1,549	13,224	10,321	0	13,915	163,150	0	0	20,433	375	0	139	25	0	226,082	1.17
1999	127,890	211	2,058	347	1,316	5,837	27,362	0	1,592	42,043	0	520	32,175	69	0	579	11		114,120	
2000	90,947	15	722	7,625	225	15,160	7,762	69	78,873	491,468	0	1,916	134,683	339						
2001	122,505	134	921	540	3,355	14,271	10,434	106	41,740	203,429	0									
2002	95,520	11	7,476	6,420	2,354	137,064	15,417													
2003	139,799	221	2,665	4,320																
2004	80,435	0																		
2005	221,752																			
2006	182,005																			
																			1994-1998 Average R/S	3.65

**Appendix B2.-Nelson River sockeye salmon brood table, 1978-2006.**

Brood Year	Escapement	Age																Total Return	Return/ Spawner
		2	3		4			5				6			7				
		0.1	0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	3.1	1.4	2.3	3.2	1.5	2.4	3.3		
1978															101	2,942	779		
1979												5,620	322,104	542	0	701	170		
1980								299	107,873	492,648	0	131	185,282	202	0	239	44		
1981	251,000				1,759	36,372	46,924	72	41,812	47,275	0	660	13,678	35	0	59	0		
1982	179,600		314	65	5,608	11,464	2,635	67	45,490	143,389	0	123	125,841	1,572	0	963	8	337,539	1.88
1983	128,800	0	852	0	5,740	43,856	23,711	244	72,682	53,532	0	936	66,102	210	0	2,964	2,751	273,580	2.12
1984	251,000	0	624	6,638	1,912	59,603	12,678	206	59,696	276,557	154	449	275,013	10,624	0	17	0	704,171	2.81
1985	314,000	0	168	671	976	77,339	8,037	171	110,618	238,924	0	0	109,028	0	0	1,632	46	547,610	1.74
1986	117,500	40	187	353	4,370	33,650	13	0	188,884	175,014	0	7,801	140,116	285	0	1,817	1,979	554,509	4.72
1987	155,700	0	57	0	1,588	71,043	4,221	143	112	151,270	0	2,986	287,652	7,874	0	3,054	288	530,288	3.41
1988	142,900	0	574	3,357	3,441	132,457	9,261	0	126,716	257,895	0	4,422	129,241	2,311	0	1,025	1,051	671,751	4.70
1989	206,800	0	520	394	3,029	21,813	8,550	0	42,705	422,926	333	510	129,324	2,124	0	104	0	632,332	3.06
1990	269,200	0	274	0	1,836	39,391	15,830	47	104,895	490,010	0	770	66,012	0	0	0	388	719,453	2.67
1991	279,200	0	43	57	850	27,591	29,153	13	93,773	397,612	0	1,059	117,254	0	0	0	0	667,405	2.39
1992	179,700	177	372	367	7,022	101,543	16,002	35	88,011	138,846	0	270	65,466	1,950	0	0	323	420,384	2.34
1993	262,200	0	588	696	6,168	32,200	0	0	101,468	68,567	0	757	43,961	0	0	247	822	255,474	0.97
1994	333,400	0	0	66	1,784	56,338	25,719	0	55,711	278,510	0	187	64,812	2,238	0	396	850	486,611	1.46
1995	338,700	0	408	1,225	9053	40,189	8,048	45	40,011	159,412	0	443	59,776	0	0	427	1,805	320,842	0.95
1996	241,600	0	487	369	4,798	103,080	373	1,351	127,901	121,449	179	258	116,142	29,140	0	284	5,141	510,952	2.11
1997	183,000	0	28	336	11,403	40,783	5,776	0	36,770	364,391	234	781	188,100	3,880	0	1,428	592	654,502	3.58
1998	159,810	0	5,419	603	8,105	49,739	8,673	0	88,210	248,385	1,082	989	122,876	1,015	0	77	738	535,911	3.35
1999	202,067	0	23,892	284	13,776	47,362	104,402	591.003	106,577	677,132	532	1,501	117,938	6,593	0	446	2,055	1,103,081	5.46
2000	182,694	234	10,599	2,296	15,861	42,510	2,498	0	53,774	363,805	0	927	75,988	433					
2001	201,962	2152	34,953	20	15,722	38,048	8,544	705	60,178	252,169	0								
2002	315,689	159	16,950	191	12,230	52,044	4,310												
2003	343,511	820	7,994	784															
2004	480,097	0																	
2005	290,000																		
2006	215,000																		
1995-1999 Average R/S																		3.09	